The Builder.

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Proposed Hotel, Churston, Devon ..... Mr. G. B. Carvill, Architect.
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The Sanatorium Question.

N Friday, November 27, there was held, in the Guildhall, Westminster, a meeting of representative men of the County of Middlesex, to consider a proposal for the necessity of an open-air sanatorium for the county, as distinct from London. It is probably not too much to say that, though somewhat late in the day, this meeting will be instrumental in inaugurating a saner system for the effective and inexpensive treatment for the prevention and cure of tuberculosis, by the means of public institutions in this country. The origination of the idea is due to Colonel Gerard Clark, who has been for some months past collecting all available data bearing on the subject. He has satisfied himself that the cure of tuberculosis can be best furthered, not by enormous buildings conceived on hospital lines, and erected at a cost of from 500*l.* to 1,000*l.* per bed, but rather on the simpler and far more economical method of separate huts surrounding the executive buildings. This method, or the pavilion method, has been constantly advocated by such practical pioneers as Dr. Philip, of Edinburgh, and Dr. Charles Reinhardt, but has been so far almost entirely overlooked in the public sanatoria, whether erected through private munificence or by public bodies.

Sir W. Broadbent, who opened the discussion on the occasion referred to, emphatically stated that the best and most effective way of dealing with pulmonary tuberculosis is by a sanatorium arranged on a system of detached sleeping huts or chalets, and that he cordially gave his approval to the scheme as outlined by Colonel Clark; to which the Chairman, Sir Ralph Littler, added that since, in the opinion of so great an authority as Sir William Broadbent, the hut system was preferable, from a medical point of view, for an institution of this nature, there was no longer any reason for a heavy outlay on buildings which were not required. Dr. Sykes, the Medical Officer of Health for St. Pancras, said he was present at the recent Tuberculosis Conference, and described briefly the conflict of opinion between the German and French authorities, the former preferring a sanatorium treatment, while the latter were in favour of home treatment. Dr. Sykes gave it as his opinion that there was room for both methods, but that a course in a sanatorium, during which time the poorer class patient is educated up to the system, must precede any effective home treatment; and he also strongly expressed the opinion that while careful attention should be given to executive buildings, patients themselves should be housed in buildings of the slightest and most economical construction.

The interesting point for architects to note is that at length weighty medical opinion is pronouncing in favour of a system which is the antithesis of the German hotel-like sanatoria and the great hospital structures which have been, and unfortunately still are being, erected in this country; and as sanatoria are being built all over England, it is essential that the greatest care should be exercised in planning them on the most economical and effective lines.

It is perhaps labouring the question to refer to the huge palatial sanatoria now being built at Northwood and Midhurst, or to that erected at Frimley for the Brompton Hospital, and the London Sanatorium at Pinewood, not to mention many others; but it should be clearly understood that if the hut system is more effective from the medical point of view, and is less costly, grave waste of public and private money has taken place, and architects who have the designing of sanatoria have a heavy responsibility if they do not keep themselves in touch with the trend of affairs.

The whole question is one which must be dealt with on its own peculiar grounds, and, as has been already pointed out in the *Builder*, in an article* on two papers read before the Architectural Association, the architectural arrangements of sanatoria must be freed from hospital lines, while the attack on this "entirely curable and preventible disease" must be general, and not a series of isolated engagements. To be thoroughly general, it must be economical, for an expenditure on the scale of the King's Sanatorium, or the Sanatorium at Northwood, and the others previously mentioned, is entirely beyond the means of county or parochial authorities, even when assisted by private donors. In a criticism on the awards of the King's Prize,* it was pointed out that the publication of such schemes as those placed first and second, schemes full of mistakes in planning, might have a most prejudicial effect on the development of sanatorium construction for this country, and although the writer of the third premiated essay gave it as his opinion that "the ideal sanatorium consists of a series of isolated huts, with windows on all four sides" (as advocated in Colonel Clark's scheme), he went on to say that "for a sanatorium of 100 beds the difficulties of heating, of carrying meals, and of supervision over so large an area, render the scheme impossible, with due regard to economy." In view of the fact that these essays were only published at the beginning of the present year, the recent declaration of Sir William Broadbent is therefore the more striking and significant.

That there will be prejudice, both medical and architectural, in favour of "hospital lines," is not to be wondered at, but a careful consideration of both methods will show that the difficulties referred to by the writer of the essay above quoted can be overcome by a practical grasp of both the medical and constructional requirements.

Considering the vast area covered by the King's Sanatorium, and the distance from patients' rooms to dining hall and kitchen, objections which we believe obtain in an almost equal degree at Northwood, it is a little hard to see why they should be greater in a hut system sanatorium; and if the hut

* The *Builder*, December 6, 1902: "Open-air Sanatoria."

* The *Builder*, April 18, 1903: "The King's Sanatorium Scheme."

system is the best for treatment and economy, it is for architects to overcome the difficulties, and see that this great work of national importance is not hindered and kept back from any want of initiative or knowledge on their part.

HOISTING MACHINERY.

NEW classes of machinery are more widely used than the various types of lifts, hoists, and cranes available in the present day. Much time and ingenuity have been devoted to the improvement of such apparatus, and to its application to domestic, industrial, and other purposes. The all-pervading influence of the lift is felt in one way or another by most of those who dwell in cities and towns, while the benefits conferred by the hoist and the crane are appreciated by those engaged in the most varied industries and occupations throughout the whole land.

So universal has the use of lifting and hoisting machinery become that the latent element of danger is seldom remembered by lift passengers and attendants, or by workmen and foot passengers, who walk unconcerned beneath dangling loads of material or merchandise on the site of works or in the public streets. Comparative immunity from misadventure has had the further effect of rendering the owners of lifting and hoisting appliances somewhat negligent, so that the first intimation of dangerous wear or disorganisation of the machinery is often given by a breakdown of more or less serious character.

Quite recently we have heard of lifts being used with badly-worn ropes, and of cranes being worked when imperfectly erected. In every case responsibility has been shuffled from one person to another, giving rise to the inevitable conclusion that none of the persons concerned could have given any thought as to the safety of the apparatus or to its maintenance in a state of efficiency. Reprehensible negligence of this kind is clearly indicative of such ignorance as ought not to exist in the present enlightened times. The element of danger can never be wholly eliminated from the use of lifts, and it must always be present in a more marked degree in the case of hoists and cranes, where no safety appliance can be devised to prevent a hanging load from falling if the rope or chain should break. For these reasons it is very important that all who make use of hoists and cranes should have reliable knowledge as to the general principles governing their design, and as to the details of their construction. To such we commend the perusal of a recently-published treatise * more especially devoted to the subject of crane construction. Mr. Joseph Horner, the author, has had a long and varied experience in the work of crane building, and being quite familiar with all the details of design and construction he is properly qualified to impart useful and reliable information to others. So numerous are the types of cranes now made that it would scarcely be possible to deal with all of them fully in a volume of ordinary dimensions. After all, it is less important to have long descriptive accounts of different varieties of apparatus belonging to the several families than to have adequate particulars of constructive details more or less common to all varieties. The author has chosen wisely in devoting the greater portion of his treatise to an account of the primary elements of cranes, and in describing the leading types more briefly.

It may appear to be a somewhat anomalous condition of things that the design of cranes should be more largely based upon practical experience than upon pure theory. This fact is the more remarkable for the reason that in no structures is a closer relationship demanded between strength and stress than in cranes. Some elementary calculations are always made, involving questions of leverage, compressive and tensile stresses, or instead of calculations the methods of graphic statics may be adopted. In either case, the determinations are valuable for fixing the proportions of the members constituting the framework, and of chains, ropes, hooks, and snatch blocks. But the main frame castings are difficult of calculation, and the author tells us that in practice they "are almost invariably copied or modified from previous designs that have stood successful service." There are plenty of examples in engineering work where practice has outstripped theory, and in many departments theory has necessarily been based upon the accumulated records afforded by practical experience. Even in the manufacture of machines, when scientists profess to be able to solve all essential problems by pure theory, the practical engineer is obliged to qualify results very considerably by his personal experience. So far as concerns the design of cranes, it is the fact that new patterns are evolved with but little direct calculation, because previous records are very largely relied upon. The tendency in the present day is towards specialisation in crane building, and the more this condition is approached by any firm the more easy is the production of modified designs. From previous records it is a simple matter to prepare tables and diagrams giving safe loads for chains, hooks, bars and rods; standard gears of different sizes, each of known capacity, will often suit cranes of different types; while jibs, posts, trucks, truck wheels, and crane housings are standardised, and may be applied to cranes differing in general design.

It is not altogether satisfactory that practice should have such a basis, chiefly because pupils and assistants in the drawing office have little opportunity of acquiring theoretical knowledge, or even of becoming familiar with the use of empirical formulæ; and, what is still more undesirable, they have no facilities for comparing calculated results with the proportions demanded by actual service. In justice to theory, we ought to say that calculated stresses can be obtained with absolute accuracy for many parts of a crane, and with a close approach to accuracy for others. But, unfortunately, the working conditions involve the establishment of stresses and strains that vary in such uncertain fashion as to baffle the mathematician. Large and very ample factors of safety are invariably used by crane builders, except perhaps in the case of some competitive tenders, but even these factors are frequently proved to have been quite inadequate. Apropos to this point, we may quote the experience of the author. He says that "there is no single section of a crane which has not failed under stress, whether checks, posts, jibs, chains, tie rods, trucks (both cast and plated), traveller girders, toothed wheels, drums." And he adds that "these accidents happen not always by reason of want of sufficient strength such as is fairly warranted by past experience, but they are due to the fact that duties of too severe a character are systematically imposed on cranes."

The last sentence here quoted is particularly significant. We all know how careless some workmen are—probably it is safe to say all workmen are—with tools and machines belonging to their employers. Crane attendants are notorious offenders in this respect, and as—to use a graphic American expression—it is impossible to make cranes "fool-proof," we must expect failures, until attendants can be persuaded or compelled to exercise commonsense. In the treatise to which this article refers the author has intentionally abstained from the introduction of formulæ for calculations, thinking it better to omit them altogether than to attempt a small selection. We think he is not far wrong in this, for the special value of his book is in the essentially practical nature of the details, and of the treatment generally adopted. Formulæ can be obtained from several well-known treatises on machine construction and structural engineering, but the experience of an engineer well versed in crane construction is rarely set down in writing.

Before plunging into practical details, Mr. Horner briefly points out the nature of the problems to be considered by the crane designer, these problems being interesting to the crane user as well. Crane framings embody applications of the parallelogram and triangle of forces, suggesting diagrams from which, when the nature, direction, and magnitude of one force is known, the characteristics and dimensions of the others can be measured off. Travelling and similar cranes exemplify beams supported at the ends and carrying loads at intermediate points. Balanced cranes afford interesting problems in statics, as the moment of the load, and that due to the overhang of the jib, must be counterbalanced by a load of equal moment. Portable cranes present still more interesting problems of similar character, as the conditions necessary for equilibrium cannot be satisfied without considering the stability of the truck as well as that of the crane carried thereon. The length of the wheel base and the gauge of the rail track must both be taken into account, and when the gauge is too narrow to insure stability of the truck, rail-clips or other auxiliaries must be applied. Some members of a crane are exposed to direct tension or compression, as the case may be, while others may be subject to a combination of compressive, shearing, and bending stresses.

In Chapter I., the author deals with the elements of triangular-framed cranes, giving a series of outline diagrams, which are sufficiently explanatory of the simple frame with raking jib, the horizontal type of jib crane, and jib cranes with side frames for carrying engines and shafting. Thenceforward, and up to Chapter XIV., we find fully detailed descriptions of the parts used in the construction of practically

*, "An Elementary Treatise on Hoisting Machinery." By Joseph Horner, A.M.I.M.E. London: Crosby Lockwood & Son. 1903.

all varieties of cranes, and the letterpress is illustrated by a large number of figures, evidently reproduced from working drawings. Commencing with the mast, or post, which is the vital element in all triangular framed cranes, the author discusses other members in proper sequence, mentioning the essential members of travelling and kindred cranes, and finishing up with hooks, snatch blocks, and chain anchorages. The matter contained in this section of Mr. Horner's book is too minutely technical for appropriate consideration in a general review, and we must refer our readers to the work itself for full details.

A subject of universal interest is the most advantageous method of crane operation. Hand power will always be employed to a certain extent, but it is now retained in many cases where steam, water, or electric power would be more economical, and more serviceable in every way. Steam power has fully justified its past employment, and it is used for driving cranes of every type, and will probably be for many years to come. But we quite agree with Mr. Horner that steam power has filled a wider place in crane driving in the past than it is likely to do again. Water power is chiefly useful for fixed cranes, although flexible pipes or other connexions frequently facilitate the application of water to some special types of portable cranes. For heavy fixed cranes and for riveting cranes in structural work water is an admirable source of power. The motion imparted is extremely regular, and is under perfect control. Perhaps the chief objection to the adoption of hydraulic power is the liability of the water to freeze in severe weather. This may be minimised by laying the pipes at a sufficient depth beneath the surface, by covering pipes above ground, and by the admixture of glycerine with the power water. The last-mentioned course can only be adopted with economy in cases where the water is used over and over again.

Within recent years compressed air has come forward as a serious rival to water as a source of power, chiefly for cranes of the lighter types. The author says the great objection to the air crane was, and still is, that the elasticity and compressibility of the air causes a jerky motion in the piston, which is fatal to precise and safe lifting. Recent improvements have largely obviated this drawback, and very extensive use is made of small air-driven hoists, especially in American factories and warehouses. Compressed air can be conveyed from point to point very readily, it cannot freeze like water, and one advantage of a compressed air service is that it can be used for pneumatic tools, and for various other appliances when these are employed in establishments where cranes and hoists are required.

Electricity is undoubtedly the most convenient agency for the operation of cranes of all kinds, if we omit from consideration the special circumstances under which other sources of power commend themselves for adoption. The great advantage of electricity is that small copper wires can be run in any direction, and for any distance, conveying energy from a central generating point for working the smallest hoist with a lift of a few pounds, or the largest crane with a lift of many tons. The wasteful expenditure of human strength, the unnecessary extravagance of fuel, and the complicated pipe systems inseparable from other methods of crane driving are obviated. Reversible motors working at moderate speeds have conduced largely to the present popularity of the electric crane, and by adopting the enclosed type of motor the injury formerly caused by dust and dirt is no longer to be feared. A most advantageous feature of the electric drive is that no current is consumed, and none of the mechanism is running idly, in the intervals of work. The author does not enter into the details of engines, hydraulic pumps, air-compressors, and electrical machinery for use in conjunction with hoisting machinery, his efforts being directed almost exclusively to the task of demonstrating the mechanical features of cranes and hoists.

Not the least useful section of his treatise is that in which various types of cranes are classified and illustrated. The system of classification adopted by the author is quite intelligible, but it appears to involve a certain amount of repetition and cross reference. This is because the various types of cranes are grouped in two main divisions—Hand Cranes and Power Cranes. It is quite evident that the essential characteristics, let us say, of a derrick are the same, whether operated by hand, steam, water, air, or electricity. Therefore a classified description becomes somewhat cumbrous if the derrick has to be described in five different places, and as other forms of crane construction are similarly treated by the author the reader may find it a little confusing to have his attention diverted so frequently to and from the different types of apparatus. We think it would have been better if each variety of crane had been treated in chapters wherein the reader might trace progressive development from the hand crane of every class to the most modern power crane of the same class. This treatment would not necessitate such passages as we find, to pick one out at random, on p. 197. It is here said, under the heading of Hand Cranes: "A description of Goliaths will be found at p. 236, in the account of Travelling Cranes, and at p. 112." Turning to p. 236, we find the only explanatory remark is the following: "The steam Goliath has been, and is still, a valuable machine. It resembles and fulfils the same functions as the hand Goliaths, but with the difference due to the nature of the motive power employed." No doubt this is quite correct, but it is just as unsatisfying as the elusive spelling book definitions with which many of us were tantalised in early youth. We turn next to p. 112, and there, in the chapter devoted to the Frames of Travelling Cranes, we find the missing definition. But it is not nearly so good as the definition given on pages 204 to 206. After all, these little inconveniences do not detract to a very serious extent from the valuable collection of notes presented by the author in this section of his treatise. He has given an excellent description of practically all forms of hoisting machinery, including triangular-framed cranes, derricks, sheer legs, Goliaths, Titans, gantry cranes, overhead cranes, and Fairbairn cranes. Adequate reference is also made to such special machines as coal tips, excavators, Temperley transporters, and floating cranes. A few words are added upon lifts, but these might just as well have been omitted, as the subject is too large and much too important to be discussed incidentally with any advantage. The various types of power cranes are treated in a very satisfactory manner, and sufficient particulars are given of the methods adopted for the application of motive power.

The general impression to be gathered from perusal of this excellent book is that the crane-building industry is on the eve of developments even more important than those already experienced. Pneumatic and electric cranes will probably be brought to still greater perfection. In factories and engineering shops the air-driven crane presents features recommending it to those who make use of compressed air for other work, but for general applicability the electric crane is to be preferred, and the rapid progress now being made in the equipment of electricity supply stations, and in the installation of private generating plant seems to show that the electrically-driven crane has a great future, and will ultimately supersede other types of hoisting machinery hitherto thought to be almost indispensable.

NOTES.

Insanitary Elementary Schools.

THE Education Committee of Hampshire has recently had under consideration an important Memorandum prepared for them by Lord Northbrook on the condition of the elementary schools in Hampshire, which number more than three hundred. Lord Northbrook states that the condition of many of these schools is very bad; some have a bad water supply, some no water supply at all, in the majority the ventilation is bad, and in nearly every school the drainage is defective. Obviously this state of things will account for much of the disease which is found in our rural districts, for we have little doubt that the Hampshire elementary schools, more especially the Church schools, are typical of the same class throughout England. Lord Northbrook suggested the appointment of a sub-committee to consider further the sanitary state of the schools, and the enforcement of the provisions of the Public Health Act. Clearly this Act ought to have been applied to these unhealthy buildings long ago. This state of things is a good example of the necessity, which has before now been referred to in these columns, of the periodical inspection of all schools, elementary and secondary, by sanitary inspectors appointed by Government. It has been customary for the inspectors of the Education Department in their annual visit to make a cursory inspection, after the examination of the scholars, of the school premises, and to refer to any obvious defect in their Report. But the light now thrown on the condition of the Hampshire schools shows how little use this amateurish inspection has been, and indicates the necessity for a complete change of system in regard to the sanitary inspection of the elementary schools throughout the country.

Historic Homes in London.

LORD ROSEBERY is in his happiest vein when discoursing on historical subjects, and he has a capacity (very uncommon in Englishmen) for uniting the particular amount

of criticism and praise which forms a eulogy, a kind of oratory well known in France. The occasion of this particular eulogy was the unveiling of a national tablet at Holly Lodge, Campden Hill, commemorating the fact that Macaulay lived there in his last years. Holly Lodge is, however, so secluded that this tablet will be less interesting and suggestive to most men than those which will presently be placed in more crowded parts, to keep green the memories and the homes of other great men. Shortly the homes of Hallam, the historian (67, Wimpole-street), of Dickens (45, Doughty-street), and of Lord Beaconsfield's birth (22, Theobald's-road) will be thus commemorated. This work of the London County Council is admirable, for nothing is more important than to stimulate the historical imagination of the man in the street. When he sees the place where a great man has lived he is able to realise his personality better, and the occurrences in which he has taken a part acquire additional interest.

Road Maintenance in Kent.

From a Report recently presented to the Kent County Council by an expert commissioned to inquire into the system of repairing and maintaining the main roads of Kent, it appears that the departmental system is recommended in preference to the contract system hitherto adopted. We have no hesitation in supporting this advice, for experience shows that the interests of the community are always better safeguarded by a competent engineer surveyor, whose only object is to promote and secure efficiency, and to whom is given full authority over the work to be executed. In the opinion of the consulting engineer, the Council have sustained a loss of between 200,000*l.* and 300,000*l.* by adherence to the contract system. After such an expression of opinion, the Council could scarcely do less than decide to give a thorough trial to the departmental system after the termination of existing contracts, and we understand that an engineer surveyor will be appointed to devote exclusive attention to the important work of road maintenance in the county.

The German Technolexicon.

This important work, the compilation of which was commenced in 1901 by the Verein Deutscher Ingenieure, will be published in English, German, and French, and we are glad to find that it has met with general approval and assistance from individuals as well as from professional bodies in all parts of the world. Up to May last 341 societies were taking part in the work, 42 in English, 272 in German, and 27 in French speaking countries, either by the systematic collection of technical expressions or by furnishing catalogues and handbooks of machines and other manufactures. Further assistance has so far been promised, and partly rendered already by 2,185 industrial firms and individuals. Research in technical dictionaries and thousands of industrial catalogues and other publications has already yielded 1,200,000 words, and to these will be added the hundreds of thousands of other terms to be furnished by collaborators. Handy notebooks are supplied, each with three indices, for the use of collaborators, and these books will be called in by the chief editor in the course of 1904. Contributions from all technical branches of work are invited, and we hope our readers will show their practical sympathy with the object aimed at by the promoters of this new technical dictionary. Full information may be obtained from Dr. Hubert Jansen, 49, Dorotheenstr., Berlin, the editor-in-chief.

The Late Sir Frederick Bramwell.

By the death of Sir Frederick Bramwell a most familiar and striking personality has been taken away. Although Sir Frederick was not born quite early enough to witness the evolution of civil engineering as a distinct profession, he was almost a connecting link between the old-time millwright and the modern civil engineer. Being gifted with a natural taste for all things mechanical, he took the keenest interest during his long life in this particular department of civil engineering. Having had few facilities in his youth for the acquirement of scientific knowledge, and never finding in study a congenial occupation, his varied and almost boundless fund of information upon engineering matters was acquired chiefly by observation and practical experience. Perhaps the most remarkable triumph of his career was that he became an eminent engineer and an acknowledged authority upon engineering practice without having been associated with any really great engineering works, and his reputation was made as a "consulting," rather than as a "constructive," engineer. Gifted with keen insight, sound judgment, and a prophetic instinct, his counsel was always wise and rarely at fault. His advice, given thirty years ago, when President of the Institution of Mechanical Engineers, that the extravagant waste of coal should be reduced, and that the heat of the sun should be utilised by the planting of quick-growing trees on barren hillsides for use as fuel, is still of interest to thinking men; and his prophecy that the steam engine would ultimately be unknown except in public museums, seems to be fairly on the way towards realisation. His advocacy, when President of the Institution of Civil Engineers, in 1884, of the hydraulic press for the treatment of large steel forgings is another instance of his foresight. Sir Frederick Bramwell took a great and earnest interest in all movements having for their object the advancement of mechanical science. He was a regular and welcome attendant at the meetings of the professional societies to which he belonged, and his opinions were always valued for the shrewd common-sense with which they abounded.

Railway Progress.

Speaking the other day at Gateshead, Mr. Wilson Worsdell, chief mechanical engineer of the North-Eastern Railway Company, said that railways in this country were making more rapid progress in electrification than in America. This statement is probably correct so far as it goes, but it does not go nearly far enough. English railways are woefully behindhand with regard to electrification, and it is only natural that the progress now commenced should be more rapid than in a country where electric traction has been practised for several years. Although efforts are being made by a few of our railway officials to atone for slothful conservatism in the past, there is no reason for boasting. Nevertheless, it is very satisfactory to learn that the North-Eastern Company is now engaged in the electrification of forty-seven miles of branch roads. This railway is perhaps the most enterprising of any in Great Britain, and is to be commended for having taken the lead in necessary reform. Other companies are doing a little in the same direction, but their energies are chiefly devoted to the easy task of watching the practical experiments of the North-Eastern Company. Railway companies are almost always averse to improvements except those literally forced upon them by legislation and the equally potent influence of competition. We should like to see all of them animated by the spirit and vigour displayed by the North-Eastern Company.

Stroboscopic Methods in Engineering.

A remarkable paper on the observation and recording of rapidly varying phenomena, by M. Hospitalier, has been published recently in the "Mémoires" of the French Society of Civil Engineers. The need in electrical engineering of being able to study phenomena which go through all their phases in less than the hundredth part of a second has led to the invention of the oscillograph. This instrument gives a clear record of all the variations in the electric pressure during the hundredth, or even in some cases the thousandth, part of a second. The principle of this instrument depends on the fact that a ray of light possesses no inertia, and hence instantaneously records any change of position of a microscopic mirror fixed on a stretched strip of metal in a magnetic field. M. Hospitalier applies this principle successfully to the steam indicator, and he shows perfect diagrams obtained from a thermal engine making 2,200 revolutions per minute. He thinks, however, that notwithstanding the great progress that has been made in the direct methods of observing these phenomena, yet indirect methods will be more useful in the workshop. Perhaps what he calls the "stroboscopic monocle" will be the instrument which will be found the most useful in practice. It consists of a minute electric motor supplied from a battery which can be carried in a pocket. This motor turns a disc pierced by radial windows through which we look at the rapidly vibrating object the motion of which has to be studied. When the speed of this disc is properly adjusted the object can be made to appear stationary or to move very slowly, and hence all the phases of the motion of the piston of a high speed motor, for example, can be examined carefully, and any necessary adjustment of the valves made. This method of studying these problems seems to us to be a particularly convenient one, and we think that stroboscopic methods of testing might be employed with advantage by electricians and manufacturers of high-speed machinery.

The Edison Cell.

With the exception of a short paper by Dr. Kennelly, read to the American Institute of Electrical Engineers, more than a year ago, very little trustworthy information has

been available about the Edison cell. The Institution of Electrical Engineers was therefore crowded last week when Mr. Hibbert gave an abstract of his paper on "The Edison Accumulator for Automobiles." Mr. Hibbert, who is one of the leading authorities on accumulators, stated that he had submitted individual Edison cells to very severe laboratory tests, and had also tested a battery of cells in a motor car during a run of 500 miles, in very trying weather, with very satisfactory results. The figures he gave show that this cell is better than any of the lead accumulators in the market, and that it can stand the roughest treatment. The car he used, when fully loaded, weighed nearly a ton, and the thirty-eight cells in their wooden frames weighed 700 lbs. The energy consumed by the motor during a run of fourteen miles was two Board of Trade units. Taking the cost of a unit as twopence, and the efficiency of the cells as 50 per cent., this would mean that a fourteen miles run cost eightpence for power, or slightly more than a halfpenny per mile. Unlike ordinary lead accumulators, the Edison cell is practically undamaged by being left for weeks uncharged, and this is a very great point in its favour. The complete cell stands 13 in. high, and measures 5.1 in. by 3.5 in. horizontally. It weighs nearly 18 lbs., and is sealed in a steel case. Five cells have a capacity of a Board of Trade unit, and they can be charged very rapidly with a current of 200 ampères. The lecturer stated that he had the cells under close observation for some months, and that he had noticed no signs of deterioration. If these cells can be obtained on the market at a reasonable price, they will be a valuable and permanent addition to the resources of electrical engineers.

Lighting Motor Cars.

IT was only on November 14 that we drew attention to the serious risk to the public caused by the excessive brilliancy of the lights used on motor cars, and the justice of our observations has been confirmed by the fatal accident which occurred on Sunday, the 21st, and which was solely attributed to this cause. The effect of those lights is to dazzle those meeting them, rendering them unable even to appreciate their own position in the road, and also to leave them blinded after the car has passed, and unable to distinguish objects following the cars. The new Act and Regulations do not touch this question, but it is apprehended that the Local Government Board is vested with abundant powers under the former Acts, and it is to be hoped this omission may yet be remedied by a supplemental Order, otherwise the separate County Councils will have to move in the matter.

Hyde Park and Kensington Gardens.

THE Office of Works have enclosed a space situated near the leaf-yard, between the Magazine and the new Police Barracks in Hyde Park, for the construction of a raised earthwork, to be covered with turf and planted with trees and shrubs, which will serve as a screen for some new greenhouses and forcing-frames. The houses and frames, used for the supply of plants to the Palace Garden, Kensington Gardens, and the Royal Parks, will replace those that are now in Kensington Gardens, between the Palace grounds and the Orangery or Banqueting House, which have become decayed, whilst their re-construction on that site is not contemplated. The latter, besides, were erected from time to time upon land that really belonged to Kensington Gardens. We understand, however, that after the removal of the present houses, etc., the ground will be restored to the gardens, so the public may reasonably expect to recover the pleasant lawn which, until some years ago, lay along the south side of the Banqueting House. Recognising how the attractiveness of our parks is enhanced by their plantations and flowerbeds, we cannot on this occasion make much complaint; still, in view of the tendency we have observed of late to rail-off and enclose portions of ground within the parks, we think that the public might justly resent any undue curtailment of their privileges.

Milton-street, E.C.

IN the last number of the *Antiquary* is a brief notice of Milton's associations with Cripplegate and the immediate vicinity. Citing the bust (by Bacon) of the poet in the church of St. Giles, Cripplegate, our contemporary says:—

"And another tribute to his memory is to be found in the name of Milton-street, hard by, in which not everyone recognises the once notorious Grub-street."

We could wish that were the case. But Elmes, a no mean authority upon such matters, records that Grub-street was renamed Milton-street for a different and more prosaic reason. It derived its new style from—as Stow would have said—one Milton, the builder thereof. We may add, too, that for our more certain knowledge of the exact situation of Milton's "pretty garden house" in Aldersgate-street we are indebted to the careful labours of Professor David Masson, aided by a coadjutor who was well acquainted with the spot many years ago. The garden, now built over, stood in the second precinct of the parish of St. Botolph, near the Alders Gate, and on the north side of the main street.

Messrs. John Broadwood & Sons' New Premises.

LAST week were sold at auction the furniture and effects of "Limmer's" old-established hotel, Nos. 1 and 2, George-street, Hanover-square, preparatory to the removal thither from Great Pulteney-street, Soho, of Messrs. John Broadwood and Sons, who will make some extensive alterations to their new premises. That firm reckon their settlement at No. 33, Great Pulteney-street from 170 years ago. Burkhardt Tschudi, the founder of their house, had been an apprentice, with Jakob Kirschmann (Kirkman), of Tabel, a Fleming. Tschudi started in business as a harpsichord maker in Meard's-street, Soho. In 1732, or not long afterwards, he removed into a house, since No. 33, Great Pulteney-street, by the sign of the "Plume of Feathers." He adopted that sign after his introduction by Handel to Frederick, Prince of Wales, for whom he made in 1740 the double harpsichord that subsequently belonged to Queen Victoria. In 1769 Tschudi retired from business on the occasion of the marriage of his daughter Barbara to John Broadwood, a native of Scotland, who was his apprentice and afterwards his partner. Mr. Henry Fowler Broadwood, who became a partner of the firm in 1836, and died in 1893, was a grandson of John Broadwood. Haydn was a frequent visitor at Great Pulteney-street, where is still preserved the private room to which he used to retire to compose. Limmer's hotel (re-built in or about 1895) at the corner of George and Conduit streets was a fashionable resort in the days of the Regency. It was originally, we gather, known as the "Prince of Wales's" tavern, wherein at a meeting presided over by Benjamin Franklin, in 1773, David Williams founded the Literary Fund, for we have read in the *Gentleman's Magazine* of May, 1807, the following announcement: "May 2, died, aged 58, Mrs. Limmer, of the 'Prince of Wales's' coffee-house in Conduit-street, Hanover-square."

Illustrations of the Holy Land.

AT the Fine Art Society there is a very good collection of water-colour views, chiefly of places in the Holy Land, the result of a year and a half's work there by Mr. Stanley Inchbold, who is a nephew of the late eminent painter of that name. Mr. Inchbold has an excellent style and handling in water-colour, and his drawings, in their strong characterisation of the bare and arid Palestine landscape, give internal evidence of truthfulness of representation derived from careful and conscientious study on the spot. The views of many places whose names are familiar in our ears—Bethany, Jaffa, Mount Hermon, Nazareth, etc., are so convincing in their realism (we do not mean realism in the objectionable æsthetic sense), that one has the impression of having made acquaintance with the scenery of the Gospels, without the drawbacks and inconveniences inseparable from an actual visit. Baalbec also comes into the series of drawings, and the illustrations of this, and of the Dome of the Rock and other buildings at Jerusalem, show that the author can treat architecture as well as landscape.

Paintings at the Dutch Gallery.

THERE has been a small exhibition, opened last week, at the Dutch Gallery in Brook-street, of paintings by Mr. Charles Conder, an artist who has a genius for colour, which shows itself in nearly all the works exhibited, but whose drawing, of the figure at all events, is unfortunately not equal to his colouring, and seem in some instances to be almost wilfully careless. Such figures as the nude one in "The Land of Dreams" (29), and the figure seated by the edge of the basin in "Poppied Sleep" (39) are, as figure-drawing, quite inexcusable. The best thing in the collection is the small picture entitled "Fête Antique" (2), which is quite a symphony in colour, though it only suggests the idea of a sketch or study for a larger picture. The various pictures for fans exhibited are not all suitable for fans, the treatment of which should be decorative rather than realistic; the best in this series is the "Wreath Fan" (8). The one called the "Corridor Fan" is really vulgar, and a painting such as no lady would wish to have on a fan; and the same may be said

of the screen-painting supposed to illustrate "Fifine" (7), which is quite a burlesque of Browning's poem. "Au Bord de la Mer" has good pictorial character, and two landscapes called "Blossoms" (15) and "The Haystacks" (36) have real merit, the latter especially. The general impression is that the author of these works is somewhat unfixed in his aims, and has not quite made up his mind what to try for in art; and that, if he means to paint the figure, he has much need of a steady course of study from the life.

SOCIETY OF PAINTERS IN WATER-COLOURS.

The Forty-second Winter Exhibition of the Society of Painters in Water-colours is quite an exceptional one for the amount of excellent work exhibited. Generally speaking, the winter exhibition is not quite equal to the May one, for which the leading members seem to reserve their most important work; but this reservation cannot be made in the present case, save in one or two instances.

There is a distinction, however, to be made between those members who keep endeavouring to put new life into their work, and those who contentedly repeat the same artistic formula in the same language. The latter are to be found both among older and more recent members. One veteran member still paints just as he did at the earliest time of our recollection of the Society; his effects in the painting of scenes in old German cities (chiefly) are just what they always were, as if made by rote; they may have seemed original and effective at first, but he has stood still and Art has advanced. There are much more recent members who are or will be in the same boat. They may seem new at present, but they repeat a convention which loses its interest with familiarity. Mr. Bulleid is one of these; he showed a great deal of refinement and finish in painting scenes in which marble masonry and decorations and classic draperies were the elements, and his work seemed, as workmanship, to justify his election; but nothing more ever comes of it; it is the same thing over and over again. Too decided a manner is a snare. Mr. North, an artist of higher calibre, will suffer for this in the future; the novelty and brilliancy of his manner in treating nature has not yet ceased to interest; but it is not nature, it is an artist's fantasia, so to speak, on nature, and the time will come when it also will be old-fashioned. This year, to be sure, he has only one small work (19), which is an extreme instance of his manner, and is very fascinating for those who see it for the first time; but when you get familiar with it the charm is much weakened. Fortunately, every now and then he produces a drawing on a large scale and in a grander style which rises above mannerism. But these smaller works, with their curious and intricate tricks of colour and texture, will have their day. It is broad truth to nature which keeps its place and does not wear out.

The first number in the catalogue is attached to a perfectly exquisite little landscape by Mr. Cuthbert Rigby, "Hayeswater," a very highly-finished little drawing looking like a large picture reduced to a small scale. Among the other contributions by the same artist, "A Sheltered Bay, Ullswater" (212) has the same kind of charm. Among the ten drawings whose titles fill the first page of the catalogue we find "Chartres" by Mr. Herbert Marshall—the south spire not quite truly vertical, which one does not expect with so experienced a painter of architectural subjects; a fine study of "A Sunset" by Mr. Alfred Parsons; "Rus in Urbe," a familiar corner in Glebe-place, Chelsea, by Miss Rose Barton; "Mist Effects after Rain—Loch Lomond," one of Mr. Colin B. Phillips broadly painted Highland scenes; "The Mill Stream" by Mr. Walter West, an entirely different style of work to those which he has hitherto contributed—a small landscape study remarkable, as are the artist's interior scenes, for its individuality of colour effect; a small landscape study "A Field-path in Middlesex," by Mr. Robert Little, with a very fine sky; and a figure and landscape picture of great interest by Mr. Lionel Smythe, founded on a verse of Rossetti's. To come on all this without having turned the first page of the catalogue is, it will be admitted, a pretty good promise for the rest of the show.

Mr. Eyre Walker's small work "Hillside Pastures" (11) with a moon rising, may be grouped with Mr. Cuthbert Rigby's drawing just mentioned; this and other drawings of his representing the class of work in which the object is realism in landscape, but realism of a very delicate and poetic type. For you may treat nature in water-colour either with the object of approaching as near as possible to the actual effect of nature, while eluding mere hard and over-acted realism; or you may use water-colour as a means of broadly expressing certain qualities of colour, etc., without making any attempt at realism. Each is interesting and valuable in its own way; the impressionist type is the most popular among artists and art critics at present; whether the other, the finished type of landscape painting, will not out-last it, remains to be seen. Among the impressionist class are Mr. R. W. Allan's broad and powerful studies of colour and atmospheric effect, more numerous than usual this year, and all good, the finest being his study of a wild leaden-coloured sea on the "North Sea Coast" (130), singularly fine and true in colour and effect, though as to the sea we do like to see a little more indication of wave forms, instead of merely wave-tones. Mr. Robert Little is another of the artists who arrests our interest as much by his methods as his results; a translator rather than an imitator of nature; unlike Mr. J. W. North in that he inserts nothing that is not in nature, he only omits what does not subserve his main artistic purpose. Mr. Little, as various works in this exhibition show, has a remarkable power of conveying an impression of grandeur of effect in works painted on a small scale. An impressionist *pur sang* is Mr. Paterson, one of the Society's later acquisitions; his "Golden Autumn" (75) represents trees by so many blots of colour with little predominant form; this passes for being an intellectual manner of painting, but, though clever, it will not hold its place permanently: his small sketch of "Orotava" (175) is a good bit of work of its class.

Among the realist artists Mr. Wilmot Pilsbury and Mr. Gregory retain their old style of treating landscape. Mr. Pilsbury's best powers are shown in such a work as "A Sussex Cottage" (123), in which his delicate and painstaking treatment of detail has full scope, and which does not profess to give the poetry of landscape. In pure landscape we feel that in these works we rather lose the poetry of the scene, in spite of (or because of?) the very delicate and painstaking treatment of detail, admirable in its way. Mr. Gregory, though in a very different manner, oppresses one with too much detail; his style is what we may call 'bristly," and in his clever drawing entitled "Where silence reigns" (118) we feel a want of repose which is out of keeping with the title and with the associations it suggests; the colour and character of every tree and shrub is so definitely insisted on that nothing is left to the imagination. In this how different to the realism of Mrs. Allingham, in her country scenes, which are the more real exactly because the detail is more broadly treated, rather suggested than definitely made out. This admirable artist, whose pictures of English rural houses, scenery, and personages one is never tired of, has, however, with great spirit, entered lately on a new class of subject, and has taken to painting Venice. As yet there is not the same charm of perfection in them that there was in her English scenes, yet one cannot but admire an artist who, after a long series of successes in one field, can turn from these to enter on a new task. Her most important work of this class is the "Venetian Fruit Stall" (295) on one of the screens, but we may also note the small picture of "S. Georgio Maggiore by Moonlight" (148) as a very successful study of a special effect.

Among pictures which represent the class of work usually associated with the names of their authors, Mr. Tom Lloyd in "The Evening Bell" (133), a garden scene with two figures who are as important to the subject and as highly finished as their surroundings, is at his best in his favourite class of subject; he interests us, however, by another work which at first sight would hardly be taken for his—"Ploughing on the Sussex Coast" (14), a landscape in broader and more poetic style than is usual with him. All of Mr. Colin B. Phillip's Highland landscapes are fine, in his usual broad and built-up style. A fine landscape in the Academic style of landscape is Sir E. Waterlow's "Sheltered Pastures" (160), a picture which illustrates this artist's feeling for composition and unity of design in landscape. Mr. Napier Henry, in "On the Crabbing Ground" (141), shows a sea and boat picture in his best style.

Figure pictures are (naturally) never so prominent as landscapes at these exhibitions. Water-colour is pre-eminently a medium for landscape; but there are two or three things of special interest. We have Mr. Holman Hunt's original study for the painting of "Claudio and Isabella" (174), not properly water-colour, but of great interest nevertheless; and two very finely painted heads by Mr. E. R. Hughes—"Idle Tears" (35), a girl bending over an illuminated book, and "Master Tony Freeman" (173), a head of an exuberant red-haired boy in a blue dress, and relieved against a broken-up background of green; all in the strongest colour, and a most effective performance. It reminds one a good deal of some of the earlier work of Mr. Holman Hunt, and it is possibly with a recognition of this that it has been hung just over the Claudio and Isabella study. Mr. Louis Davis exhibits two very well designed circular cartoons for proposed paintings at Welbeck Abbey, "Love Active" and "Love Passive" (207 and 229); these are in black and white, so that one cannot judge of them as paintings, but they are capital decorative drawings. Mr. Elmslie has given a lovely face to his figure called "Songs of Spring" (243), and Miss Rose Barton shows her feeling for childhood in her charming drawing of a very small person "Selecting her Buttonhole" (124) from a flower-bed. Mr. Walter West is prominent in the middle of one of the srreens with his admirable picture "Shuttlecock" (277), as remarkable for the subtle colour pervading the whole as for the grace and vivacity of the figure. Her partner or antagonist in the game is seen reflected in a mirror at one side of the picture. He has also, on the other side of the same screen, several interesting pencil studies of figures.

Among works which are marked by a special character is a large one by Mr. Matthew Hale "The Passing of Arthur" (87), a much more ambitious work than is usual with this artist, in which the mystic barge is seen crossing a lake dimly lighted by the last gleams of a red sunset. There is a weird and solemn effect in the scene, only a little spoiled by the fact that the dimly-seen water does not look watery enough. Under any light in which water surface can be seen at all it will surely assert itself as water; it is true that the dull glow of the sky is more or less repeated in the water, but not sufficiently with the appearance of reflection, and thus the effect of what is in the main a poetical work is rather weakened. Mrs. Stanhope Forbes's "Under the Greenwood Tree" (251), with the vertical lines of the tree-trunks running up it, and a figure in Elizabethan costume singing to a lute at their feet, is, like all this lady's productions, a very clever and original work.

Architectural subjects are pretty largely represented. In subjects which may be called purely architectural Mr. Reginald Barratt is predominant; among half a dozen admirable works we may mention especially "A Venetian Bridge" (43); "Gondolier's Shrine, Venice" (138), showing a very careful painting of part of the Ducal Palace; "The Piazzetta" (198), with an equally careful painting of part of Sansovino's Library; and "Holy Water Basin, Siena Cathedral" (206), an admirably executed piece of detail. Mr. Rooke, besides some smaller studies at Vézelay, exhibits a large drawing of the "West Front and Tower of the Church of St. Père sous Vézelay" (242), one of a series, apparently, which he is executing for the Birmingham Museum; this is purely and professedly an architectural drawing, and admirable as such. Mr. Albert Goodwin's architectural subjects may rather be said to be architecture treated as landscape, and somewhat idealised into a visionary aspect, as in "The Citadel, Cairo" (50) and "Venice—Blue Twilight" (167), the latter a very successful treatment of a difficult subject. He also exhibits several small landscapes, including a study of Niagara (92). His vignette-like treatment of city scenes receives the compliment of imitation in Mr. Herbert Marshall's "Rouen" (122) and Mr. Matthew Hale's "Bristol—Evening" (166); Mr. Marshall has also a fine drawing of "Grey Saumur" (30). Mr. S. J. Hodson exhibits several architectural pictures, of which the best is an interior of "St. Bartholomew's the Great" (42); his large drawing of "St. Paul's, as seen from the roof

of St. Bartholomew" (59), is not satisfactory in that the proportions of the dome and the drum beneath are not right—somewhat too high and narrow. There is hardly any structure about which so many mistakes are made by painters as the dome of St. Paul's.

A special feature in the exhibition is a set of small drawings presented by members of the Society to the King and Queen on their Coronation. These, all framed in white, make a pretty show at the end of the room. There are 59 of them, all small drawings, and not exactly important productions of the various artists, in an artistic sense, but this could hardly be expected; they formed a very appropriate gift from an art-society, and contain many interesting and pleasing artistic suggestions.

NOTES AT A DORSET WATERING-PLACE.

IN 1722 the authorities of Bridport obtained an Act empowering them to restore and rebuild the haven and piers of their port, to make sluices, wharves and landing-places at or near Bridport mouth, described as an open and level piece of land lying between the east and west cliffs which bound the sea there. The preamble of the Act sets forth that it was made in order to bring the town to its ancient flourishing state; that by reason of a great sickness, "and other accidents," the wealthy inhabitants had been swept away, one consequence of which was that the haven had become neglected and choked with sands. The pier, however, was not built till 1742, and in 1756 a sea-wall was built, and the pier and harbour enlarged. Something of the intended prosperity seems to have followed, for it is on record that in 1794 there were eleven vessels belonging to the port, and making regular trading voyages.

All this kind of prosperity is at an end now. A stray coasting schooner or two is generally in the harbour, and that is all, though boatmen living there say they remember when the basin was nearly always filled up with ships. The railway has altered all that. Before it was made, the small port and the slow river Bride (or Bridy) meandering through the flat meadows between the town and the harbour, formed the real channel of commerce, a fact expressed in the very name, Bridport. Now the river is permanently barred from the harbour basin by sluice gates, through which the high tide fills it, when the sluices are closed and the water held up till low tide, to be then let out in a rush to scour the entrance to the harbour; for the old difficulty of the sand silting it up is still urgent. And now the "open and level piece of land between the east and west cliffs" has become a sea-side holiday resort, and taken on it the name of West Bay, its ameliorations being supposed to be promoted by a company entitled "West Bay Improvements, Limited"; but except as to the provision of exceedingly convenient and well-kept bathing cabins, the improvements seem decidedly "limited" and in some cases doubtful. What West Bay chiefly wants is to be let alone; but there is probably little chance of that; as soon as a quiet and unobtrusive watering-place gets to be at all known and liked, the next step is to spoil it by building it up and introducing the promenade and band element.

The first impression of West Bay to the visitor is probably in most cases rather depressing; there is a faded and gone-to-pieces look about it, owing to the existence of various disused stone buildings, probably warehouses of some kind built at the time when the port had an active trade. Something might perhaps usefully be done in removing these and laying out the ground where they stood. But further acquaintance shows that the place has many recommendations, for those who do not want the promenade and band style of entertainment. On each side of the little port rise steep and beautiful windswept grass downs, extending for some miles along the coast each way—open, fresh and unspoiled nature; especially the downs in the west direction after passing Eype Creek. Then the bathing, in fine weather, is simply ideal, the beach being a steep one of small shingle, always clean and giving deep water almost close to the margin, as if the sea were one great swimming-bath. The drawback is that when there is anything of a breeze on shore it sets up a surf on the steep beach which renders bathing rather dangerous; you may go in easily and safely enough, no doubt—*sed revocare gradum;* but can you get out again? the under-rush of the receding water being so great; so that last summer a lady came near being drowned in sight of her friends on the beach through mere inability to make head against the undertow, and was with difficulty got ashore by two men who were in considerable danger themselves. This is a thing to be guarded against, and if "Improvements, Limited" devoted a small portion of their funds to hiring a man and boat to be in readiness to give help to bathers, it would be money better laid out than in some other ways. For their bathing accommodation however—substantial and roomy cabins, clean and well kept and not disfigured by advertisements, they do deserve praise. It may be added that in windy weather there is safe bathing to be had by a walk of a mile and a half or so over the west downs to Eype, where there is a much flatter beach.

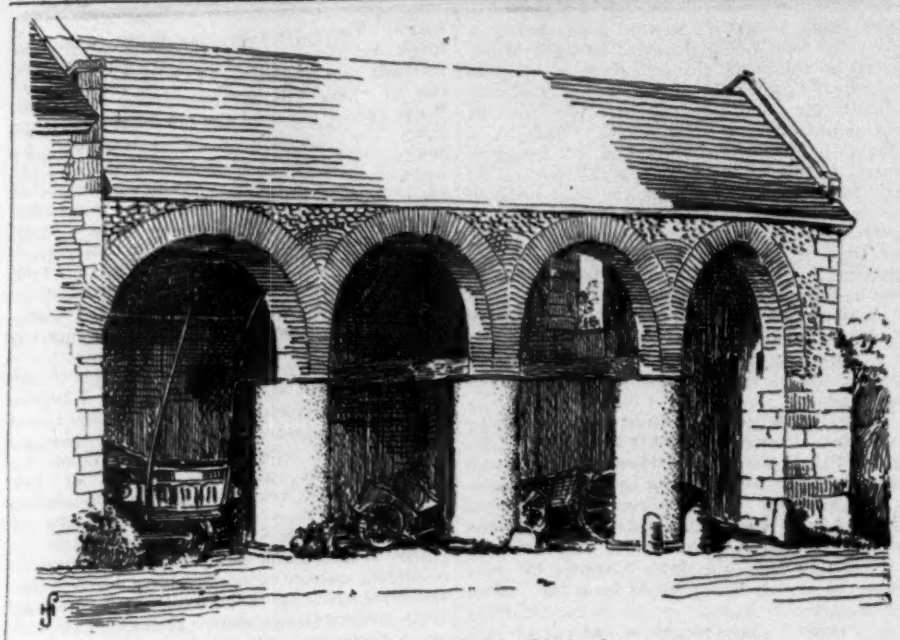
The entrance to the basin at West Bay is by a narrow channel between two long parallel jetties, like Boulogne and Dieppe entrances on a smaller scale, and built for the same reason—to get an entry which it may be possible to control by the scour of the tidal water. In the lithograph sheet of sketches in this number, "West Bay from the Jetty" shows the east jetty, the sketch being made from the end of the west one. Except in the finest weathers it is a ticklish place to get in and out of in a sailing boat; the scour from the sluices at low tide does not avail to prevent a considerable bar forming at the mouth, and often, when the sea is quite safe outside for a well-handled sailing boat, the exit between the jetties is too risky to be attempted; then, when the wind is blowing right inshore it is impossible to sail out through the opening, and if it is blowing straight off shore it is impossible to sail in again; so that pleasure of sailing is beset with certain difficulties. Parallel with the east pier runs the only important new building, Pier-terrace, which is seen in the distance in my first sketch, and of which a view of what may be called the land front is given in another sketch. This is a very picturesque row of houses built by Mr. E. S. Prior, and which seems to be a puzzle and bewilderment to the surrounding inhabitants. Any one with an eye for character in architecture would, we imagine, see at once that the architect's idea was, considering that the terrace is close on the sea, to give a kind of ship-like character to the architecture, which is done in a very clever and original manner; but no one seems to understand this. Each of the arched openings on the land side gives access to two front doors, but the two houses intercommunicate on one or more floors, a special planning adopted with the view of rendering them available, as lodging-houses, for either large or small parties of tenants. The whole thing is admirably suited to its purpose, and very well constructed in principle; but unfortunately it had to be cheaply built, and the effect of this sad necessity is beginning to show itself. On the opposite side of the green before the terrace is the long, rambling, picturesque old inn, the Bridport Arms, shown in a sketch in one corner of the plate. The original intention, we believe, was to carry Pier-terrace round three sides of the green; if this is done, we hope the Bridport Arms, and the quaint characteristic little houses between the green and the beach, will be respected; they are an important part of the picturesque character of the place. One improvement which might very well be carried out would be to build a terrace of nice houses behind the short promenade walk which extends from the basin to the foot of the west downs. A broad asphalted terrace has been formed here, running along the top of the beach, at the cost of a wealthy inhabitant of the neighbourhood who bears a name known in Bridport annals for centuries back; behind this is a metalled road, but on the landward side of the road is a strip of unsightly waste land. Here would be the place for a real improvement on land that seems waiting to be built upon, and where the houses (if they were such as Mr. Prior would build) would not only spoil nothing, but somewhat add to the general appearance of the place, besides providing house-room which seems to be wanted, since the demand for houses in Pier-terrace was quite beyond the supply of this season.

Bridport, with its wide main street with trees down the centre, is a very pleasant little town. The chief industry is still rope-making; once upon a time Bridport supplied all the cordage for the Royal Navy, but those great times are gone long ago, and must have gone now at any rate in these days of wire rigging and steam. There are rope manufactories doing a large business still, however, with modern methods and machinery, and an inspection of one of them fills an interesting afternoon. Some two or three of the old buildings in the town are sketched in our lithograph. In South-street, which is at right angles to the main street and forms the commencement of the road leading down to West Bay, is the prim stone front of the eighteenth century almshouse, apparently in former times a private residence; a Parliamentary return of 1786 describes it as "one messuage, burgage, or tenement, situate on the west side of South-street, now on lease to William Bearn for the residue of a lease of 99 years." On the opposite side of the street is the interesting late Gothic house shown in another sketch, now I believe some kind of workmen's club; of its original purpose there seems to be no record. Then on the west side again, and further down the street, is the grim-looking bit of late mediæval front, recessed between two modern houses, which is connected historically or traditionally with St. Leonard's chapel in the Parish Church, and was perhaps the Priory.

Among objects of architectural interest outside Bridport is Mr. Prior's fine solidly designed little modern Gothic church of Bothenhampton, on a rising ground a little way off the road between Bridport and West Bay; and, further eastward, Burton Bradstock shows us a picturesque village and an interesting late Gothic church, in the interior of which the visitor may notice the excellent decorative effect obtained by Mr. Prior's simple but effective treatment of the window-glass and leading, and the restored polychromatic decoration of the roof timbers. Walditch Church, a little church a mile or two from West Bay, is entirely rebuilt in revived Gothic, but retains an interesting Norman font.

Abbotsbury, some ten miles off eastward along the coast, is reached by a beautiful drive along the downs, and is celebrated, as nearly every one knows, for its great swannery formed at the head of the Fleet inlet, a kind of backwater behind the Chesil beach, running up from Portland to Abbotsbury; interesting also for some remnants of the former monastery, chief among which is the large barn just outside the little town, still in use in connexion with the present farm. It has an open timber roof, not however so fine as some old English barns can show; it is somewhat skimped in its scantlings. St. Catherine's Chapel, at the top of a bare rounded hill, is one of the most peculiar mediæval buildings in England; it may be doubted whether there is anything like it anywhere else in the country. Its exterior appearance is shown in the sketch; it is one of the windiest situations, one would think, in the county, and the old lady who keeps the key is to be looked for on the lee-side of the building—in this case the east, as there was a west wind on the occasion of my visit. Hutchins ("History of Dorset") suggests that it may have been one of many chapels built in the reign of Edward IV. as a kind of expiation of some of the bloodshed between the houses of York and Lancaster; it may be so, but its exposed position and extensive range of view over land and sea, as well as its peculiarly fortress-like aspect, suggest the idea that it was a kind of combination of a church and a stronghold. The general style of the architecture externally agrees with the assumed date, though some of the interior details, if taken by themselves, would look like an earlier date. The roof is a pointed stone barrel vault, with bold transverse ribs some four or five feet from centre to centre. The walls are very thick, more than four feet, but the springing of the roof, as an additional precaution against thrust, is weighted by the heavy parapet wall built up externally, and with round-headed openings on to the space between the inner and outer roof. I see that the old engraving in Hutchins's "History" shows these openings in all the four bays; but as my sketch was deliberately and carefully made, and does not show them in the farthest bay, I believe they are not there. They may have been closed up in some repair and refacing at this point. The second buttress is without its capping, as shown in the sketch. It is worth notice that the massive buttresses correspond to no visible structural feature in the interior vault, the ribs of which are the same section from end to end. The interior is now a mere shell, but a great deal of carving—bosses, etc., in the roof—is still in fair preservation.

The train, or a walk of some six miles if preferred, brings you to Powerstock—"Poor-



A Farm-shed near Chideock.

stock" in Hutchins's history, perhaps more correctly, since it is "Povrestock" in Domesday, and "Purstock" in a later mediæval document. There is nothing of particular interest at Powerstock, save that it is the way, or one way, to Eggardon Hill,* with its ancient encampment on the summit, known all over the neighbourhood as the "Roman Camp," but certainly not that, whatever it is. It used to be the fashion to derive the name from *agger*, a rampart, and *dun*, a hill; a kind of lawless marriage of Roman and Saxon words which was probably prompted by the idea of its Roman origin: the *dun* we may admit, but the *agger* seems very doubtful. Hutchins mentions that in a "perambulation of Purstock Forest," *temp.* Edward I., it is spelled "Ecredon," which takes us further away from *agger*. It is pre-Roman, and therefore may be called "British" for want of a better name; but it has been a most remarkable piece of work for its probable period, of the highest interest even to those who, like the present writer, do not profess to be experts in ancient earthworks. It shows, all round the platform on the top of the hill, a continuous double rampart and ditch—the rampart is triple in part of its length, with some lines of outwork defences at the principal gates, which seem much more scientifically laid out for defence than might have been expected from a barbarous people. Inside the camp area are traces of a number of pits; Mr. March and Mr. Solly, in their careful paper on the subject, enumerate 123—of which some four or five have been explored, and which are believed to have been pit dwellings, sunk to a certain extent and with a conical roof formed over them. In the days of the "Roman" theory of the camp the explanation was that the hill had been inhabited before the ramparts were made; but Messrs. March and Solly point out that no pit is cut through by the walls of the camp, there is no pit near to them and none between them. The place was, in fact, an early fortified town; it is only on account of the supposed necessity of crediting the ramparts to the Romans that any doubt about the connexion between the ramparts and the dwellings need have existed. One reflection made on the subject by Mr. Solly in a previous paper on the subject is worth quoting:—

"The Roman road which runs west from Dorchester and passes through Bridport comes tolerably near to this camp on Eggardon, but does not come to it, leaves it instead contemptuously on one side as a place of no importance. Herein lies the human interest connected with these ancient ramparts and the old road. They tell of a state of things existing before the advent of the Roman power, and of the civilisation introduced by those whose mission it was 'to spare the conquered and war down the proud.'† The mounds of earth, and yonder road leaving them on one side, tell what a blessing to Britain was the Roman conquest."‡

Four miles west of Dorset, the high road to Charmouth and Lyme Regis passes through the pretty old-fashioned village of Chideock (locally pronounced "Chiddock"), containing some nice old road-side houses and a pretty but not important late Gothic church, partially restored. What interested me at Chideock, or near it, however, was the farm shed shown in the sub-joined sketch, which stands in a lane not far from the village. The short cylindrical stone columns look as if they had formerly carried something different from the comparatively modern brick arcade which is now built on them. The whole, however, as it now stands, forms a curiously picturesque structure to come upon suddenly by the side of a country lane.

From the steep road going down into Chideock from Bridport there is a fine view of the most prominent hill on this part of the coast, known as "Golden Cap," from the yellow appearance of the upper strata on the side towards the sea. It is a steep hill rising direct from the beach, halfway between West Bay and Lyme Regis, in a conical shape, and with a flat top, as if the upper portion had been cut off; a character which is repeated, in a less marked manner, in other hills in the district, and no doubt records the work of the ice-plough or plane of an ancient geological epoch. Golden Cap ought to be reckoned as one of the attractions of West Bay, as it is within six miles and reached by a most beautiful walk over the downs.

A word about the people as well as the places of this part of Dorsetshire may conclude these rambling remarks. In no district in England have I been so struck with the natural courtesy and pleasant manner of the inhabitants towards strangers. One day, when caught in heavy rain during a long walk, I asked to stand in a cottage porch for shelter, but was immediately invited into their best room (about eight feet square) and requested to make myself "as comfortable as circumstances permitted," and when the rain showed no signs of relenting, they must lend the stranger an umbrella and merely ask him to leave it at a certain shop in Bridport where they could call for it another day. (They were not put to *that* inconvenience, at all events.) Another day, when our party were doubting as to which of two roads would take us home, from a small cottage a little way off there came a young woman in plain attire, but with the manners of a lady, to ask if she could be of any assistance to us. In a Bridport shop a man who had not exactly what I wanted, instead of trying to persuade me that what he had was better, came out on to the doorstep to point out to me the shop (in the same trade) where he thought I could get it; and a Bridport banker changed a cheque for the stranger who presented it, without even accepting a reference to his London banker, politely replying that "he was sure it was all right": perhaps the most remarkable instance of all! It is pleasant to recall this kind of trustful and courteous habitude as characteristic of the country side generally. H. H. S.

* For a walk to Eggardon however, it is better to avoid Powerstock and bear round to the eastward of the hill, where there is a very pleasant route over fields and through a farmyard on the side of the hill.

† "Parceresubjectis et debellare superbos."

‡ Those who mean to visit Eggardon would do well to look in advance at these two papers: "Eggardon Hill, its Camp and its Geology," by H. S. Solly; and "A critical and material examination of the Hill-Fortress called Eggardun," by H. Colley March and H. S. Solly. They are to be had, I believe, from Dorchester publishers. Mr. Solly is the minister of the Unitarian Church at Bridport.

BRIGHTON AND HOVE HOSPITAL FOR WOMEN.

The assessor's award in the competition for the new women's hospital for Brighton and Hove was announced last week. There were sixty-six sets of designs submitted in this competition, which seems to have been satisfactorily conducted, with the exception of a single indiscretion. Several competitors being dissatisfied with irregularities they were unable to explain, we took the trouble to make inquiries as to what had actually taken place since the drawings had been sent in. It seems that on the arrival of the designs they were immediately unpacked and hung up in a hall specially hired by the Committee at the request of their assessor, Mr. G. T. Hine. Mr. Hine wished to see them altogether to facilitate making his award. The indiscretion referred to lay in an "at home" given by the hospital authorities to view the drawings before the award had been made, to which competitors were invited. On representations made by the Royal Institute of British Architects of the undesirability of such a function before the award had been made and published, the function was not abandoned, but competitors were informed that they would not be admitted.

Such action is to be regretted, for it is obvious that there is very little possible harm in the competitors seeing one another's designs, while admitting the public to view them *before* the assessor and Committee have made their choice gives opening to suspicion of unfair influence brought to bear by any member of the outside public who may feel interest in the result. We do not suggest that this is what took place in this instance, but we think that all right minded people must see the advantage of conducting a public competition, for however small an undertaking, on lines that admit of no possible outside influence. And to the architects who have given much time, and money, and brains for no return whatever, common politeness alone would suggest a little consideration for their feelings.

The four premiated designs were on view in Brighton last Wednesday. It is a very great pity under the circumstances that funds would not allow of hiring the hall before-mentioned for a public exhibition of all the designs. If the assessor's awards gave satisfaction to the majority, it would have disarmed further criticism.

The roads surrounding the site, which has three frontages, are from 10 ft. to 15 ft. above the surface level of the site, and the conditions require that full advantage of this be taken in light and airy basements. The accommodation required comprises a general ward for fourteen beds; maternity, private, and isolation wards; operating theatre; out-patients' department; staff rooms; administration and nurses' quarters.

The first premium has been awarded to Mr. John L. Denman, of Brighton. In describing the plans it is necessary to bear in mind the difference of level between the street and the site. The ground floor is practically that on a level with the road, the floor below being a basement which also is above the level of the site. Mr. Denman's plan covers the greater part of the site, and shows no means of future extension. His ground plan is well disposed, containing the staff and board rooms in the centre of the main block; on the right, to the west, the matron's rooms; on the left, to the east, the house surgeon's, connected by corridor with a separate block containing the out-patients' department, thus getting the out-patients on the ground floor, which is a convenient arrangement; beneath the staff rooms in the basement are the kitchens, connected with the upper floors by service lifts, which are situated rather far from the kitchen. The first floor shows a good deal of south sun and light shut out by the projection of various blocks, such as the isolation wards, the lavatories, stairs, and the roof of the out-patients' department. The general ward gets light on the north, east, and south. The operating theatre shows too many recesses and doors, no less than five opening out of it. The maternity and labour wards are well arranged on the west. The second floor

shows nurses', pupils', and night nurses' bedrooms.

Design No. 46, by Mr. E. P. Howard, shows a good grip of the problem in mass. The accommodation is given in blocks; on the north the administration block, on the east the wards and out-patients', on the west the nurses' home; a space on the south suitable for a future extension of wards, etc. These three blocks are connected together on each floor by corridors only. So good is the arrangemen' that in our opinion it might have been worthy of more than a second place, but we must add that the omission of the proper staff accommodation asked for ought to have debarred it from consideration by the assessor.

No. 25, by Messrs. John S. Quilter and F. Anderson, is a very economical plan of considerably less cubical contents, we should say, than any of the others. One reason for this is that the wards are placed upon the ground floor, great use being made of the basement, and thus no grand staircase is required. The out-patients' department is shown in the basement, reached by an inclined approach, and also the staff rooms, as well as the kitchens, etc.; on the first floor are situated the nurses' rooms.

No. 11, the other third premiated design, shows no title to this distinction, unless complexity and covering an immense amount of ground, with many exceedingly ill-lit corridors and rooms, be one, which we cannot imagine. Can the assessor have been attracted by the elevations?

No limit was fixed by the conditions regarding cost, an estimate of which had to be provided by each competitor; it would be interesting to compare the reports of the successful and unsuccessful candidates.

THE PEDRAIL.

In an article published last December on "Transport on Roads" we described and illustrated the essential features of the invention known as the Pedrail. This device is intended for application to the wheels of traction engines and waggons. A wheel constructed on the Pedrail system consists of a disc carrying round its periphery sliding spokes with ankle joints to which feet are attached. When the disc is revolving three feet are always upon the ground; above these feet is a short rail resting on small wheels or rollers, connected with the ankles, and the rail is connected with the axle-box of the vehicle. The complete arrangement constitutes the equivalent of a wheel, which places feet on the ground, one in front going down as one behind goes up, and levers along the rail carrying one end of an axle. The principle is practically that of an inverted railway, for the rail is run over the small wheels attached to the feet, instead of being run over by them.

As before stated, the Pedrail is equally applicable to traction engines and to waggons. When four wheels are fitted to a vehicle each wheel is arranged so that it can act separately, while all four continue to do their work. Each foot and each wheel can adapt itself to the surface to be traversed, and the axles are pivoted so that either wheel of a pair can travel at a higher level than the other, or lift itself over a higher obstacle. In a four-wheeled vehicle the two pairs of wheels can adjust themselves so that the axles may be at different angles with the horizontal, and in a traction engine all four wheels are driven simultaneously, without hindering the universal adjustment of any wheel to suit the inequalities of the ground. It would not be easy without a number of drawings to describe the mechanism by which these various movements are accomplished, and such a description is not necessary, as full particulars may be obtained from Mr. Diplock's book.*

In our previous article we expressed the opinion that the great number of working parts would render the Pedrail unsuitable for adoption except at low rates of speed. Since then, we learn that the inventor has devoted his attention to the simplification of the mechanism, and that a considerable advance has been made in this direction. In fact, it is now believed that the Pedrail engine is quite capable of being run at speeds up to 15 miles an hour without involving excessive wear or strain on the working parts. If this anticipation should be justified by practical experience there will undoubtedly be a great future for the invention. It would then be perfectly suitable for the expeditious transport of merchandise from town to town, as well as for the more leisurely duties ordinarily expected from a traction engine, and, further, it would offer an admirable substitute for tramways under circumstances in which rail tracks might be either a hindrance to traffic or unjustifiably costly.

Last week we had an opportunity of witnessing a series of cinematograph pictures demonstrating the practical usefulness of the Pedrail engine for various purposes. In one set of pictures the machine was shown first in the act of drawing a long train of heavily-laden waggons, and then, being detached from the train, in operation as a stationary hauling engine, pulling the waggons up to itself by means of a wire rope. Other views showed an engine fitted with a jib crane bringing cases of merchandise up to a railway waggon and lifting them in; an engine turning a complete circle with a radius of no more than 15 ft.; and the same engine "walking" over an obstruction consisting of timber baulks piled to a height apparently of more than a foot above the ground.

Professor H. S. Hele-Shaw, who has taken great interest in the invention since its first realisation in a practical form, delivered a lecture upon it last Saturday under the auspices of the Liverpool Self-Propelled Traffic Association, at the Walker Engineering Laboratories, Liverpool University. He then said that the wheel had reached its utmost limits both in regard to weight and speed on ordinary roads, and expressed the belief that we must look to the Pedrail for any future development of the carrying power of the traction engine. In this lecture Professor Hele-Shaw confirmed the favourable reports previously made upon the Pedrail, saying it would climb the steepest hill, walk over large stones and baulks of timber, while laughing at ruts and soft ground.

An opinion such as this, coming as it does from a recognised authority on road traction, certainly strengthens belief in the feasibility of this extremely ingenious invention, which, we may add, has also received the thorough approval of Lieut.-Colonel Crompton, C.B., a retired officer of the Royal Engineers with considerable experience of road locomotion in India.

* See the *Builder*, vol. lxxxiii., p. 545.

LETTER FROM PARIS.

The question of the construction of a new legislative palace is still before the Committee in an undecided state. Three schemes have been selected for discussion from amongst the many which have been put forward, and these are:—First, the construction of a large parliament hall in the courtyard of the Palais Bourbon; secondly, the construction of a new building on the site of those of the Tuileries which were destroyed in 1871, joining the Pavilions of Marsan and Flore; and, thirdly, the erection of a large building in the garden of the Tuileries, on the axis of the Rue Castiglione, on the site where existed the famous Salle du Jeu de Paume. The first scheme consists in the construction of a parliament hall from the design of M. Buquet, architect to the Palais Bourbon, covering a surface of a little over 9,000 superficial feet, with a height of 60 ft., and to contain 600 numbered seats for the members. The hall would be lighted by a large cupola glazed with decorative coloured glass, and at night time the electric lighting would be 30,000 candle-power. The second scheme, of erecting a building on the site of the old Tuileries, meets with considerable opposition, as it would certainly tend to spoil the remarkable vista extending at present from the Place du Carrousel to the Arc de Triomphe. Another proposal which does not lack interest has been put forward, and this would consist in the re-arrangement of the buildings of the Palais Royal into one vast palace, reuniting into one the Chambre des Deputés and the Sénat, to be called the "Palais de la République."

The Committee of the old Salon is to be re-elected in January. The re-election takes place every three years, and includes the choice of a president, and it is now therefore a question who shall be the successor to M. Bouguereau. Since the death of M. Bailly it has been the custom to elect a painter; but as MM. Bonnat, Detaille, and J. P. Laurens have successively filled the office the list of candidates among painters who are members of the Institut is now rather restricted. M. Paul Dubois, the sculptor, appears to be the candidate most in favour, but he is Directeur of the Ecole des Beaux-Arts, a position which is no sinecure, and it may be doubtful, therefore, whether he will be able to accept the presidency of the Salon in addition.

There is again talk of reconstructing or enlarging the Luxembourg Museum, where the demand for more space is continually increasing. This has been talked of for so long however, without anything being done, that it is rather as a matter of curiosity than of practical interest that we refer to two schemes now under consideration, which will probably meet with much opposition from the inhabitants of "rive gauche."

One of these is a proposal to build a new museum on the site of the ancient Pépinière, bordering on the Rue Auguste Comte. The surroundings will certainly be satisfactory and the light perfect, but it will take away a great piece out of the public garden. The other proposal is to rebuild the museum on a site to the right of the existing one, adjoining the Rue de Vangirard, which would necessitate the destruction of many fine trees in that part of the garden. There is a general wish on every hand, however, that some definite scheme should be decided on, as the Luxembourg Palace, besides its want of space, is quite unsuited for an Art Museum.

In the garden in question a monument is to be erected to the memory of the late regretted Secretary of the Academie des Beaux-Arts, M. Larroumet, and another, now being completed by M. José de Charmoy, to Alfred de Vigny. This consists of a statue of the poet, above life size, on a lofty pedestal, the four faces of which will be decorated with figures representing some of the principal personages in his works.

It is hoped that by the end of December the Champ de Mars may at length be rid of the remains of the Exhibition which still encumber it, and be delivered up to the Service des Promenades for its decorative aspect to be reconstituted. At present the spectacle, to a visitor proceeding from the Invalides to the Champ de Mars, is a most melancholy one. Those who witnessed the splendours of the 1900 Exhibition find on the site now only a desolate piece of waste land with the remains of some of the exhibition buildings still unremoved. When these are once cleared off, it is intended to make a new park of the ground, divided by a cross road into two distinct portions. On the side next the Seine there is to be a "Jardin Anglais" with basins of water and alleys of trees; and on the side next the Ecole Militaire will be a "Parc à la Française," with lawns and parterres. Then Gabriel's fine façade will again be seen with a fitting foreground.

The well-known building journal *Le Bâtiment*, which took a principal part in the initiation and the organisation of the "Exposition de l'Habitation" lately held at the Grand Palais des Champs Elysées, has decided to install in the large building which contains the offices of this journal a permanent exhibition of drawings, models, materials, and plant relating to the construction, decoration, and fitting up of private buildings and public works, and to organise periodical competitions amongst architects, decorators, tradesmen, and specialists in the arts and industries pertaining to private and public architecture. The exhibition will comprise plan types of the systems of allotting large properties for building purposes, plans and models of houses, workshops, works, etc., capable of construction and purchase on the annuity system; all the usual and special materials employed for building; specimens of objects and materials for decoration, furnishing, heating, lighting, and sanitation, and the usual plant employed for building purposes.

A proposal has just been made to the Paris Municipal Council to consider the question of allowing a first application of the Cassalonga system of subterranean rolling platform for passengers to be made on a circular line between the Place de la Concorde and the Place de la Bastille, at a depth of 17 ft. by a width of 17 ft. The cost is estimated at 35 million francs. The Council has appointed a committee to examine and report on this proposal.

Parliament has before it a new law proposing the use and fitting up as hospitals and sanatoriums for consumptives of the various buildings seized from the non-authorised religious associations which have been expelled.

The work of constructing the cellars and basement of the new building for the Imprimerie Nationale is now terminated, and the

important steel and masonry construction which will form the large printing halls and offices will be commenced immediately.

A most interesting archæological discovery has just been made by M. Redon, the architect of the Louvre, who some short time back, owing to an idea which entered his mind that a portion of the old buildings constructed by Lemercier under Louis XIII. and Louis XIV. was wanting in correct proportions, and having also noticed that the windows of the present ground floor of this portion were more suitable in design to upper windows, made some excavations in the garden bordering the building occupied by the Minister of Finances, and discovered that the Louvre building rests on a dressed and ornamental basement 24 ft. deep. It was evidently the intention of Lemercier to surround these buildings with a moat of this depth, similar to that which surrounds the Château of Saint Germain, and this work was continued and completed by Claude Perrault when he constructed the three façades and his remarkable colonnade. The Louvre would have been approached by means of three bridges crossing the moat opposite the present three entrances, but owing to the quantities of stone which then encumbered the ground around the buildings, the moat was left in abeyance, the excavated portion filled in, and the very existence of the lower front wall forgotten until the present discovery made by M. Redon. It is a curious fact that the celebrated Colonnade of the Louvre has always been praised for its fine proportions, but no thought was given to the possibility of there being a high basement wall below. The Vieux Paris Committee is taking a great interest in this discovery, but it is scarcely to be hoped, for the present, at least, that the originally proposed moat will be formed, and the Louvre buildings appear in the full height of their façades as intended by Lemercier and Perrault.

The much-discussed question as to a site suitable for the construction of a new Mairie for the Eighth Arrondissement of Paris, appears to have been solved by M. Bouvard, who suggests that the building should occupy the garden opposite the Eglise St. Augustin, on the Avenue Portalis.

The Société des Amis des Monuments Parisiens at its last meeting made known its regret that the Municipality had not been able to come to terms with the owner of the Parc de la Muette, so as to secure the preservation of this remarkable property, and passed a vote that the preservation of the two central avenues be considered on the allotting of the property for building purposes, for these two avenues are the last remaining vestiges of the work of Le Nôtre at Paris.

The competition for designs for a monumental fountain to be called "Fontaine Subé," at Rheims, has been decided in favour of M. André Narjoux, architect, to whom the first premium has been awarded. The sculptors are MM. Gasq and Auban.

The administration of the Paris Opera has opened a competition for designs for the cover of the official programme to be issued at the beginning of the coming year. Premiums of 40*l.* and 20*l.* will be awarded, and similar competitions will take place each year.

A society composed of some well-known architects and men of letters has been formed at the Mairie of the Palais Bourbon for the purpose of studying the history of persons, monuments, and streets connected with the Seventh Arrondissement of Paris, and the grouping of all documents and information likely to be of interest for the purpose of founding a local museum and library special to this artistic quarter of Paris.

The Académie des Beaux-Arts has appointed the Committee to prepare the list of candidates for the chair left vacant by M. Roujon, who has been made Perpetual Secretary. This Committee is composed of MM. Gérome, painter; Jean Thomas, sculptor; Daumet, architect; Chaplain, engraver; and Rever, musician. The chosen candidates are in the order following:—MM. Georges Berger, Bouchotte, Georges Leygues and Jules Comte *ex æquo*, Camille Bellaigue, Dr. Richer, Clausse, and Charles Normand.

The Société du Nouveau Paris has just held its first annual meeting at the Grand Palais, presided over by M. Frantz Jourdain. After the election of the Committee, the President made an eloquent speech exhorting the Society to put into hand at once the study of the scheme of work proposed for the practical embellishment of Paris. This scheme comprises chiefly the completion of the principal streets and boulevards, such as the boulevards Haussman and Raspail, the Rue de Rennes, and the transformation of the Palais Royal.

On November 19, after several years of work accomplished under considerable difficulties of all kinds, the second sheet of water was encountered in the work of piercing the artesian well at the Buttes-aux-Cailles at Paris, at a depth of 1,900 ft. The water rises at the rate of 15 gallons per second at a temperature of 28 deg. centigrade, and contains arsenic and iron. This work was commenced in 1866, and abandoned in 1870, but continued in 1892 by the firm of Paulin Arrault, when a tube of a diameter of 35 in., weighing 180 tons, was sunk. M. Henry Rousselle, the Municipal Councillor of the Maison Blanche quarter of Paris, to whose energy is due the carrying out of this important work, proposes to persuade the Municipality to construct a large piscina at the Buttes.

The Société des Ingénieurs Civils de France has addressed to the public authorities a protest against the proposed destruction of the Eiffel Tower and the Galerie des Machines. They ask that if it is considered absolutely necessary to demolish the Eiffel Tower, another site should be chosen for its re-erection. The Council, however, has confirmed its decision that the tower shall be demolished at the expiration of the concession, and that a date should be fixed for the demolition of the Galerie des Machines; in the meantime, this latter building will be installed for bicycle races.

The French Pavilion at the Exposition of St. Louis; the construction of which has been entrusted to M. Bouvard *fils*, is to be an almost exact reproduction of the Grand Trianon, a perfect specimen of French architecture at the time of the French occupation of Louisiana. The interior decoration and furniture will be pure Louis XIV., and M. Marcel, the new Directeur des Beaux-Arts, is engaged with M. Locquet, the Curator of the Garde-Meuble National, in choosing the furniture and art objects. Some of the finest specimens of Gobelins tapestry will decorate the wall panels.

The death of Dalou prevented the realisation of two schemes which he had undertaken and for which he had only made first sketches. One of these was the decoration of the façade of the Crematorium which M. Formige had been commissioned to build at Père Lachaise. Since the loss of Dalou, no sculptor has seemed so fitted the replace him in such a work as M. Bartholomé, whose "Monument aux Morts" at the cemetery will always remain one of the most remarkable sculptural works of the XIXth century. The other work projected by Dalou was the completion of his "Triomphe de la République" in the Place de la Nation by groups of animals placed around it and forming fountains, as in the basins at Versailles. If this is carried out, it will probably be done by M. Gardet, the well-known animal sculptor.*

The English members of Parliament who have been visiting Paris went to see, among other things, M. Rodin's studio at the Depôt des Marbres, where they saw a replica of his fine group "Le Baiser" and the fantastic and still unfinished "Porte de l'Enfer," and other works; and a strange production suggested by Hugo's "Légende des Siècles, and which the sculptor calls the "Main de Dieu." It consists of a gigantic hand rising from a block of marble, and holding in it two small figures representing Adam and Eve.

At Tarbes on Sunday last a monument to Danton was inaugurated, the work of a sculptor of the Pyrenees country, but well known at Paris, M. Desca. His work, done many years ago, ought to have had the first premium in the competition opened by the Municipality of Paris some fifteen years ago, but an inferior work was put over it for reasons of official politics, and M. Desca only received the second premium. Now the town of Tarbes has done him justice and erected his powerful and original work in one of their public squares. The statue is in bronze, with a pedestal adorned with two bas reliefs representing "The Departure of the Volunteers in 1792," and "Danton Haranguing the People."

MM. Monchablon, Biron, Jaussely, and Lappara, the winners of the Grand Prix de Rome in painting, sculpture, architecture, and music, respectively, of this year, have, according to the usual custom, been the guests of the President and Mme. Loubet at a lunch given in their honour at the Elysée before their departure for the Villa Médicis.

* It is a question whether the monument is not much better as it is, without the addition of this *bizarrerie*.—Ed.

MOTOR-CAR REGULATIONS.

The Regulations, 22 in number, made under the Motor-car Acts, 1896 and 1903, have just been issued, and are accompanied with an explanatory circular. The fees for registration are 1*l.* for a motor-car and 5s. for a motor-cycle, and it is to be noted that a change of ownership, if the registration is continued, involves a fee of 5s. for motor-cars and 1s. for cycles. The marks indicating the registration on the cars have to conform to the order in shape, position, number, and lettering, but the order permits of variation in the design, and designs, painted or otherwise, may be substituted for plates, so the artistic faculty in motor manufacturers will be encouraged. A very important provision is contained in Article XI., as it provides for the lighting of the identification mark in the hour that elapses between sunrise and sunset and lighting-up time for the car. General identification marks can be assigned to manufacturers. Copies of entries in the Register are only to be supplied to the general public on their showing "reasonable cause" for requiring such a copy and on payment of a fee of 1s.

The fee for licences to drivers of motor-cars and cycles is 5s., and it must be noted the licence remains in force twelve months from the date it is granted. If lost, the licence can be renewed for a fee of 1s. These licences are subject to suspension on conviction of any offence in connexion with a motor-car other than a first or second offence in relation to speed only. It is somewhat curious that a motor-cycle has not been defined in the Act, and the explanatory memorandum can only suggest that the term includes motor-cars on not more than three wheels and of a weight not exceeding 3 cwt. The reading in the memorandum of Section 8 of the Act, relating to specified roadways not exceeding 16 ft., that this indicates the width from hedge to hedge and not the width of the metalled surface, will give dissatisfaction, and, we submit, is erroneous. This section was intended to allow the authorities to deal with second and third class roads, and such roads, being of a rough class, have often wide ditches or rough turf by the hedges, over which it is impossible to drive, and this reading tends to make the section a dead letter. The memorandum is most instructive, however, as a whole, and should be carefully studied by motorists.

ARCHITECTURAL SOCIETIES.

Edinburgh Architectural Association.—At a meeting of the Edinburgh Architectural Association, held on the 25th ult., in the Association's Rooms, 117, George-street, a paper was read by Mr. David M. Nesbit, Leicester, on "Warming and Ventilation." Architects everywhere, said the lecturer, insisted inflexibly that the schools they were about to erect, the colleges and universities, the theatres, the places of worship, etc., should now and for the future be placed under the best hygienic conditions, and, more important still, that the hospitals for the sick and injured and all places devoted to the great science of healing should have unfailingly the essentials of pure air and an even, genial temperature. School buildings, he said, required special treatment, and he was sure that not less than 1,800 to 2,000 cubic feet of air per hour should be given to each child in public schools, so as to ensure the maintenance of a healthy atmosphere. Having spoken of the advantage of the plenum and vacuum systems, Mr. Nesbit referred to the cabinet system, an invention of his own, which he had called the "Unplenumette," the novel feature of which was that a recess was built in the wall above the floor line, and the heating surface was fixed within. The whole of the apparatus was out of the reach of the occupants, and yet gave ready access for adjustment of heat and ventilation. It could be readily dealt with for repairs, could be kept scrupulously clean, and, in a word, it might be regarded as strictly hygienic. His desire for a wide adoption of the cabinet arrangement was founded upon the vital necessity of cleanliness in the apparatus that directly conveyed air to the lungs. Warming and ventilation, he maintained, should go together. These matters, as far as regarded churches and chapels, had not in the past had the consideration needful,

but he noted that those responsible for the health and comfort of their congregations were gradually overcoming the defects. He strongly advocated the plenum system for public buildings, and pointed out that the overhead plenum system, to force the air downwards from above the ceilings, had already been carried out with successful results. The lecturer dealt with a number of other matters, and spoke of the waste by steam traps, hot wells, etc., and showed how that waste could be prevented and economies obtained. A vote of thanks was accorded Mr. Nesbit.—*Scotsman.*

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—A meeting of this Society was held on the 26th ult. in the rooms of the Literary and Philosophical Society, Leopold-street, Mr. Thomas Winder (President) in the chair. Mr. J. R. Wigfull, A.R.I.B.A., gave a lecture on "A Short Tour in Warwickshire and Gloucestershire," illustrated by lantern slides. The lecturer described a few of the many places of interest to architectural students in the counties of Warwick and Gloucester. He drew attention to Ford's Hospital, a fine half-timbered building at Coventry, erected 1529, and still used as almshouses. The castle and old buildings in Warwick were also described, together with St. Mary's Church, which contains the celebrated Beauchamp Chapel. The contracts relating to the erection of the latter are in existence, and show the business-like manner in which building operations were conducted in the fifteenth century. To Stratford-on-Avon, where the birthplace of Shakespeare and other buildings were noted, the lecturer passed in review a number of old Cotswold villages with their simple stone houses, many of which are as perfect and clean as when erected three to four hundred years ago, except that time had added many charming effects of colour to the roofs and walls. Passing from these to Tewkesbury the Abbey Church was fully described. This was erected in the beginning of the twelfth century, and is a fine example of Norman work. In the fourteenth century a beautiful series of chapels were erected round the choir. These contain many fine monuments.

NORTHERN ARCHITECTURAL ASSOCIATION.—At a meeting of the Northern Architectural Association, held in Newcastle on the 25th ult., the Rev. Canon Savage, of South Shields, read a paper entitled "The Distinctively English Type of Church." He said he would take the subject from a historical point of view, and he had two things in mind. First of all, he wanted to see what evidence they could get from English architecture as to the sources of religious life in England. In that sense, it was historical in a very remarkable way. Side by side with that—and perhaps even more distinctly—he wanted to bring out some points which showed the characteristic English national character. At the present time the fashion was a sort of Little Englander fashion—to decry everything in English architecture. But he held that there had been a very distinctive national character in church buildings right through—a sturdy, common-sense character. That was no conglomerate—not a mixture of Celtic, Norman, French, and German, and Italian and Byzantine, which all had differences. Canon Savage began with the Augustine Mission at Canterbury in 597 and the Northumbrian in 635. For forty years, in the Northumbrian Mission, there were nothing but wooden churches. Then they commenced to build in stone, the first churches being at Monkwearmouth and Jarrow. They got an entirely new type of church, with rectangular nave and chancel. The Northumbrian Mission spread all over England, and, with the exceptions of Brixteth and Wing, they had in all the early churches over the whole country this rectangular east end. The Anglian churches were almost always built in one position—protected by water; and that was, ultimately, the cause of their destruction, when the Danish corsairs came. The western towers were probably refuge towers, and served a further purpose of being a lookout. This was characteristic of the period between the early Anglian and the Norman. From the prevalence of the Northumbrian form they had evidence that it was from the Celtic mission and not from the Italian that this country got its conversion. The lecturer dealt with the influence of the Norman invaders, who put down everywhere their almost brutal form of architecture. They were a heavy-handed, heavy-footed people, who built heavily. There were beauties in Norman architecture, but the architecture, generally, was brutal, coarse, and heavy. Their idea of Church government was strong monastic centres. But it was a curious thing that, within a century, the Norman apsidal churches had to give way to the normal national type of rectangular east end. Then, from 1175 to 1195, they had the most rapid development of architecture in all the centuries of the past. Thus they came to the distinctively early English style, and here they had the strong assertion of the English restraining taste and common sense. At the end of the twelfth and the beginning of the thirteenth century, all over the country, they had in almost every parish indications of church building. There was the uprising of the English as a nation. After that the style tended to become fantastical, in the Decorated period. That might be accounted for by the national life; for it was the age of chivalry. Canon Savage brought his lecture down to the period from 1345 to 1355. The wars had broken down the power of chivalry, and gave the English a national life and gave them the idea of a national army and navy. There was a great commercial development, and the Commons became the dominant partner, and the national life struck out in many ways. English was adopted as the national language; and there was the influence, also, of a black death. All this was translated into the church building, and they got developed the purely English type—the Perpendicular, which was the type of the plain, common-sense, average Englishman. So they got a complete preponderance of the Perpendicular everywhere except in Northumberland—partly because of the crushing influence of Durham Abbey and partly because of the fear of the Scotch. The Perpendicular style was the expression of free national life. From first to last they had continual importations from abroad; but from the very first the national type remained, built upon the old wooden churches of Northumbria.—*Newcastle Chronicle.*

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—At a meeting of the Society of Engineers, held at the Royal United Service Institution, Whitehall, on Monday, Mr. J. Patten Barber, President, in the chair, a paper was read on "Mechanical Stokers for Electricity Generating Stations," by Mr. Albert Gay, M.I.E.E., and of which the following is an abstract:—After referring to the general desire and the various attempts to bring about the more economical utilisation of energy in general, and of electrical energy in particular, the author proceeded to show that in order to obtain the best results from coal, perfect combustion was essential. He pointed out, however, that though that result might be possible in the laboratory, under ideal conditions, the means of obtaining it in every-day practice had yet to be discovered. He observed that good work, however, had been done, and he proceeded to describe the necessary requirements of an ideal mechanical stoker. He then described various appliances of the kind, the aim of the makers of which was to approach the ideal as nearly as possible. He divided the different kinds of mechanical stokers into two main types, viz., top-feed and underfeed; the former being divided again under the sub-divisions of sprinklers and cokers. As their names imply, the fuel in the former is fed above the bars. In the case of the sprinklers, small quantities of fuel at a time are sprinkled into the furnace, and in the case of the cokers the fuel is dropped just inside the furnace door on the dead plate, and allowed to coke before being pushed forward into the furnace. The under-feed type is fed with fuel below the bars, the fuel being forced up through the fire. The advantages claimed by makers, and the disadvantages claimed by some users were also dealt with, and the opinions of central station engineers of experience were quoted; and while the author generally indicated his appreciation of the improved economy of mechanical over hand firing, he is not at present satisfied with the reliability and cost of up-keep.

WESLEYAN CHURCH, CARK.—A new Wesleyan Church is to be erected at Cark. There will be sitting accommodation for 250 people. There will be a sliding partition so that part of the room can be used as a school, where 150 children can be accommodated. Plans are being prepared by Mr. Henshaw, architect, Barrow.

THE BUILDERS' BENEVOLENT INSTITUTION:

ANNUAL DINNER.

THE fifty-sixth annual dinner of the Builders' Benevolent Institution was held on Thursday last week in the Whitehall Rooms, Hôtel Metropole, Charing Cross, W.C. The chair was occupied by Sir Weetman D. Pearson, Bart., M.P., the President, and there were a large number of friends and supporters of the Institute present, including Mr. Aston Webb, R.A., President of the Institute of Architects; Mr. W. F. King, President of the Institute of Builders; and Messrs. H. H. Bartlett; R. B. Brown; A. Burton, J.P., Mayor of Bermondsey; B. C. Cass; S. Collins, L.C.C.; J. H. Colls; J. Carmichael; B. P. Ellis; T. Gregory; C. Gude; F. Higgs; H. F. Higgs; W. Higgs; J. Hill; A. Howard; C. G. Hyde; W. Lawrance; J. W. Lorden, Mayor of Wandsworth; E. W. Moir; H. Northcroft; A. E. Parker; E. E. Pearson; P. Preston, Master Carpenters' Company; J. Randall; A. Ritchie, J.P.; G. Gilbert Scott; T. Stirling; R. H. H. Stranger; B. Tabberer; C. Wall; E. White, J.P., L.C.C.; S. Young, F.S.A.; and T. Costigan, Secretary.

The loyal and patriotic toasts having been honoured (Mr. Clarendon G. Hyde proposing, and Captain T. Stirling responding to, the toast of "The Imperial Forces"),

The President proposed the toast of the evening, "The Builders' Benevolent Institution." Which of them, he said, had not felt at some period of life—either as a beginner or as one carrying on a large work—some anxiety as to his financial position? The man who had not felt that was devoid of imagination. He felt sure that had contractors such an institution as this Builders' Benevolent Institution there would be plenty of funds, for all contractors would be providing for the days when they might have to go to it for help. Builders were very much better off than contractors. Why, contractors were absolutely at the mercy of the engineers, whereas the builders had their arbitration clause. Contractors had never had the perseverance or ability to put themselves in such a position. The Builders' Benevolent Institution ought to be heartily supported by builders, for it had done a noble work. It was an old Institution, but it had not reached the zenith of its usefulness. If, instead of granting pensions, which, he was glad to say, had been increased from 39*l.* to 42*l.*, they were able to grant 142*l.* per annum, how much happier would many of them feel than they did to-day? In the vigour of youth and the strength of manhood they might feel independent of this Institution, but one never knew what the exigencies of trade or work might bring them to. He appealed to them in all sincerity to support such a deserving Institution—not on account of good trade and an overflowing exchequer, but on precisely opposite grounds: an empty exchequer and the possibility of being beneficiaries of the Institution. That was appealing to very low motives, and to those present the possibility he referred to might seem a very remote one, but it was not so to the hundreds outside. Many a home would be made happier—and no home needed to be made more happy than that of the man who endured all the troubles and trials of a builders' life—if there was an assurance of protection from absolute want. The merits of the Institution were known to most of them, but probably few of them knew that the total expenses of management amounted to only 6½ per cent. of the income. No institution could be more economically administered, no charity receive more careful scrutiny; and yet the funds of no charity were more generously bestowed. At the present time there were twenty-six male and twenty-nine female recipients of the charity, and the number was far too small. Still, it was the maximum that the funds permitted, and he earnestly appealed to them liberally to support the Institution.

Mr. William F. King, President of the Institute of Builders, then proposed the toast of "The Worshipful Company of Carpenters." The Carpenters' Company stood foremost among City companies, not only for its benevolence, but also for its work in regard to technical education. In their schools at Titchfield-street and Stratford, and in their examinations, the Company showed what could be done by such a body for education. One of the chief reasons of the success of the Company in regard to technical education was the character of the men who had filled the office of Master. He

had much pleasure in coupling with the toast the name of the present Master, Mr. Percy Preston.

Mr. Preston, in response, said that according to a distinguished guest that evening, carpenters could be rather easily dispensed with, and timber could largely be replaced by iron, steel, and concrete. Even if that were so, he did not think the Carpenters' Company would "go under" as long as they maintained the work they were doing in their schools. At Stratford they had nearly 1,000 students during the day and evening—those attending in the evening studying to advance themselves in the work they had been engaged on in the day. At Titchfield-street they did not admit any student who was not engaged in some workshop during the daytime. He wished that he could induce builders to get some of the classes more adequately supported than they are. The carpentry and joinery classes were admirably supported, but the smithing and plastering classes were not supported in the way they should be. The plasterers' class did not number more than five or six students. He thought that builders might get better attendances for these classes. The instruction students received would be to the advantage of themselves and their employers.

Mr. J. Howard Colls then suitably proposed "The President." They were proud of their past presidents, of whom many were present that evening. The large attendance that evening was due to the fact that they had such a distinguished President this year, and, he must add, also to the energy and ability of their Secretary, Mr. Costigan. The President had done work which was of great benefit to the Empire, and he could not but remember his work at Dover; they were proud to think that they had as their President a man who was carrying out such a work, which would hold, when completed, the whole of the fleet of England.

The President, in the course of his reply, said he was blessed with partners who took much of the burden of work off his shoulders. It was owing entirely to their prodigality of expense in the initial outlay on the Dover works that those works did not suffer any serious damage in the recent great storms. The top of each staging was 26 ft. above high water, and those terrible seas, instead of washing the staging away, went between the piles and under the staging. Works of this magnitude were of such a serious character that they were really undertaken, if he might say so, by madmen. They had on that contract a capital outlay of close upon 400,000*l.* before they began to receive as much money monthly as they were spending, and when they paid such a heavy premium for safety, they had a right to expect that safety which fortunately they had when the stress came.

Mr. H. H. Bartlett then proposed "The Architects and Surveyors." When he thought of the duties of modern architects he often wondered how they coped with the requirements. There had been a great improvement in architecture, and there were many modern architectural works which would live through the ages to testify to the ability of their designers. Architects were men of high standing, who deserved the respect of builders, for, as a rule, they held the balance between employers and builders in a just and satisfactory way. It was a pleasure to most builders to be associated with architects, and to put into stone, etc., their ideas and conceptions. As to surveyors, they suffered, as compared with architects and builders, by the fact that there was no evidence to the public of the onerous work they carried out. When one thought of the complicated matters which a quantity surveyor had to deal with, one could not fail to be surprised at the success and accuracy of his work, and one could not but regret that that work did not come more before the public. He hoped that quantity surveying would be kept in the proper hands. Some of them had had experience of some architects' quantities, and he thought that architects would be well advised to leave that work to the surveyors. With the toast, he coupled the names of Mr. Aston Webb, R.A., and Mr. H. Northcroft.

Mr. Aston Webb, in responding for the architects, said he had long been persuaded that they could not go on without architects, and he was equally persuaded that they could not possibly go on without builders, and therefore they could not do better than support that Institution. The Navy had a saying, "It is on the Navy, in the good providence of God, that our wealth, prosperity, and peace depend." He thought they might paraphrase that, and say that it was on our Builders, in the good providence of God, that our health, prosperity, and lives depend. They all wished the Institution success. There was a class of men from whom they could learn some useful lessons on charity and help to each other, *i.e.*, working men. They knew that sometimes the working man worked too little and drank too much, but, on the other hand, the working man was ready to pay the last item he had in order to help his friend. That sympathy he had in trouble was no doubt due to the fact that the working man felt more often than others the pinch of want and the pain of sorrow, but the fact remained as an example to ourselves.

Mr. Northcroft, in replying for the surveyors, said that if there was one thing more than another that a good quantity surveyor prized, it was honesty, and that they endeavoured to obtain. If there was one thing they put before honesty, it was truth, or what Mr. Bartlett called conscientious accuracy. One of the difficulties of the quantity surveyor was the inaccuracy of the architect sometimes. In a recent issue of the *Builder* was a design for a village church. If the north elevation is correctly described, the altar is at the west end of the church, which was a little unusual, but this was probably not so, as was seen by the west elevation, which was perhaps correctly described. The position of the font was singular, not to say unclassical, and some architects might show the projection of the baptistry or of the curious annexe at the east end if their west elevation were really serious. The door into the vestry shown on the west elevation was 5 ft. wide by the scale, and as it only admits the clergyman, it need not be wider than that used by the people. It was also to be observed that the clergyman must be an athletic Christian to jump 4 ft. from the ground to his doorway. The meaning of the steps shown in section on the so-called north elevation was not at all clear, as they apparently brought one to the top of a slope which runs down again to the same level below the cill of the vestry door as that at the foot of the steps. One entrance and exit only is shown for the people at what would be in an ordinary church the west end of the north side, and this was shown at about the same width as the vestry door on plan. If the level on the west elevation was any indication at all, several steps would be required to reach it from the ground, which are not shown on the plan. It would be perfectly fair to inquire why the *Builder* or the Royal Academy, for that matter, could take notice of such an inconsistent piece of work.*

Mr. Basil P. Ellis, in proposing "The Vice-Presidents, Committee, and Stewards," said that unfortunately a large number of master builders in London did not contribute to the funds of the Institution. He hoped that the words of their President would be seen by those masters who did not contribute.

With the toast was coupled the name of Mr. T. F. Rider, who suitably responded.

During the evening subscriptions were announced to the amount of 1,250*l.*, the President's list, the total of which was 876*l.*, including the following:—The President, 105*l.*; the President's firm, 105*l.*; the Institute of Builders, 50*l.*; Messrs. John Aird and Sons, 25 guineas; and the Associated Portland Cement Manufacturers, Ltd., 15 guineas.

AUSTRALIAN PATENTS.—The Parliament of Federated Australia has passed a Patent Act to cover the six States forming the Commonwealth, namely, New South Wales, Victoria, Queensland, South Australia, West Australia, and Tasmania. New Zealand is excepted. The Bill, which was introduced into the Australian Senate and received its first reading on June 26, has now been assented to, and the commencement is to be fixed hereafter by proclamation. The cost of a patent under this new Act to cover the six States comprising the Commonwealth will be about one-sixth of the cost of taking out patents at the present time to cover the same area. There is, however, a fee of 5*l.*, payable before the actual issue of the patent, and a renewal fee of 5*l.* before the expiration of the seventh year.

* Mr. Northcroft's remarks would be more to the purpose if the drawings referred to had been working drawings, which they were not. They were merely sketches, on a very small scale, showing a picturesque treatment for a village church, not for a special building to be actually carried out; they were hung at the Academy as a picturesque sketch, and published by us on the same ground. Unfortunately picturesque quality does not appeal to some people.—ED.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE third general (business) meeting for the present session of the Royal Institute of British Architects was held on Monday at No. 9, Conduit-street, Regent-street, W.

The minutes of last meeting having been agreed to,

The following gentlemen were elected:—As Fellows: Messrs. L. Kitchen, Hull; B. T. Kitchin, Architect to the Local Government Board, Whitehall, S.W.; S. Perks, P.A.S.I., Cheapside, E.C.; B. A. Slade, Berkeley-square, W.; M. Seth Ward, Westminster, S.W..

As Associates: Messrs. E. P. Archer, Finchley; O. M. Ayrton, London; H. A. Battley, London; T. J. Bee, Sidcup; H. T. Bill, Birmingham; H. Black, Cape Town, South Africa; Guy Church, Warlingham; J. D. Clarke, Wimbledon; W. E. Couch, Westminster, S.W.; P. B. Dannatt, Blackheath, S.E.; H. E. Davey, Horse Guards, S.W.; R. R. Gall, Aberdeen; J. Green, Birmingham; T. F. Green, Cricklewood, N.W.; E. M. Joseph, London; A. E. Lacey, Ashford, Kent; T. E. Richards, South Wales; T. Simpson, Strawberry Hill; H. B. Smith, Port Elizabeth, South Africa; G. Walker, Richmond; S. Warwick, London; and R. Wylie, Gateshead.

As Honorary Associates: Lord Balcarres, M.P., F.S.A., Junior Lord of the Treasury; the Right Hon. Lord Windsor, P.C., D.L., First Commissioner of his Majesty's Works.

As Hon. Corresponding Member: Mr. C. F. McKim, President of the American Institute of Architects, Royal Gold Medallist 1903, of New York, U.S.A.

The results of the November Examinations were then announced, as follows:—

Preliminary: J. R. Adamson, Glasgow; E. Ainsworth, Blackburn; G. A. S. Atack, Blackburn; R. W. Atkey, Bournemouth; J. A. Baskerville, Manchester; E. E. Beaumont, Sidcup, Kent; F. W. Beech, Wolstanton, Stoke-on-Trent; D. Bell, Scarborough; C. H. Blacka, Todmorden, Yorks.; O. A. Bloxam, Rugby; A. H. Boss, London; W. Boyes, Pontefract; A. Bracewell, Keighley, Yorks.; R. O. Bridger, South Hampstead, N.W.; S. T. Brittain, St. Annes-on-Sea; G. D. Burgess, Ealing; A. C. Burlingham, Edgbaston, Birmingham; F. W. Burnett, Tondu, Bridgend, Glamorganshire; K. Cameron, Eccles, Lancashire; D. J. Campkin, Sutton, Surrey; C. F. Cargill, London; H. P. L. Cart, Upper Norwood, S.E.; J. W. Carter, jun., Rugby; C. D. Carus-Wilson, Rugby; R. W. Cash, Aberdeen; C. Catchpole, Ipswich; H. Cherrington, Tipton, Staffs.; H. Clarke, jun., Chelmsford; H. H. Clarke, Weston-super-Mare; G. B. Clay, Hyde Park, W.; G. D. Clunies-Ross, London; K. A. Cockrill, Gorleston, Great Yarmouth; P. J. L. Collins, Wembley, Middlesex; J. A. Cook, Cardiff; E. Cooper, London; F. R. Cooper, Kettering; F. J. Daniel, Clapham; O. Davies, Walthamstow, E.; G. L. Day, Taunton; J. J. Dobson, Wingate Station; E. F. Duncanson, Bickley Park, Kent; R. B. H. Ebbs, Bromley, Kent; L. W. Edmonds, Balham, S.W.; R. Evans, Bloomsbury; J. S. Ferrier, Edinburgh; L. J. Finning, Exeter; H. W. Flanagin, Summer Hill; J. G. Flanigan, Belfast; W. S. Flockhart, Hyde Park, W; E. H. Forster, Doncaster; P. Fraser, Streatham Hill; H. French, Hedon, near Hull; L. Furniss, Regent's Park, N.W.; F. H. J. Gabbatt, Burton-on-Trent; J. Gillespie, St. Andrews; E. B. Glanfield, Slough, Bucks; B. M. Goodwin, Croydon; J. W. Green, Pitsmoor, Sheffield; E. Haley, Manchester; H. Hall, Leicester; S. Hall, Withington, near Manchester; W. Harvey, Hastings; T. L. Hastie, Dennistoun, Glasgow; N. Hawkins, St. Leonards-on-Sea; J. Wilson Hays, Wingate, Durham; F. H. Heppel, Worcester; L. J. Hicks, Egham Hill, Surrey; E. E. Hodder, Thornton Heath; G. Hollins, Newcastle, Staffs.; T. G. Jackson, Clapham Common, S.W.; H. G. Jefferies, Chelmsford; A. W. Johnson, Sheffield; C. M. Jones, Swindon, Wilts; S. Kaye, Alnwick; G. G. King, Belfast; R. Knoop, Lancaster; A. N. Knox, Glasgow; M. B. Lawson, Camden-square, N.; C. H. Lay, Ipswich; B. Legge, St. Albans, Herts; D. C. Leigh, Winsford, Cheshire; J. G. Martin, Oldham; F. C. Mason, Banstead, Surrey; D. J. Moir, Perth, N.B.; T. S. Moore, Maryport, Cumberland; H. A. Munnion, Clapham, S.W.; B. O. Nash, Brighton; H. Neimann-Smith, Lewisham Hill, S.E.; H. Nurse, Wakefield; C. R. Orchard, Exeter; H. W. Parnacott, Penge, S.E.; E. Parr, Sunderland; A. J. Perrin, Dulwich, S.E.; T. Pickmere, Liverpool; J. V. R. Porteous, Lytham, Lancashire; L. J. Prest-

wich, London; J. H. Ravenscroft, Liverpool; W. A. Rigg, Carnforth, Lancashire; C. W. Roescher, West Bridgford, Nottingham; P. W. Rollin, West Kensington; W. Rose, Bedford; F. Scatchard, Castleford; J. F. Schofield, London; E. A. Scott, London; J. A. Seaton, Lytham; G. B. Selleck, Plymouth; G. P. Smith, Tonbridge; R. I. Smith, Weston-super-Mare; S. P. Smith, B.A., Oxon.; H. Southon, Putney, S.W.; J. W. Stanley, Manchester; W. L. Stephens, Liskeard, Cornwall; E. Stevens, Newcastle-on-Tyne; T. M. Swales, Wigan; W. W. Tasker, North Shields; R. H. Taylor, Perth, N.B.; D. H. Thomson, London; T. W. Thompson, Trimdon Colliery, R.S.O., Durham; H. Thorne, Barnstaple; S. H. Thorpe, Tufnell Park, N.; H. C. Tomkins, Newport, I.W.; A. Travis, Littleborough, near Manchester; L. Velasco, Kensington, W.; A. L. Wade, Dulwich Common, S.E.; C. P. Walgate, Beverley, Yorks.; J. L. Warry, Wood Green, N.; G. Waterhouse, Leytonstone, N.E.; W. C. Watson, West Hartlepool; S. J. Wearing, Leicester; H. S. Webber, Public Works Department, South Africa; S. J. Webber, Maidenhead, Berks; T. G. Welburn, Campbeltown; E. Weston, Blackpool; E. A. Weston, London; A. R. Westworth, Sydenham, S.E.; W. A. Whiddington, London; J. E. Whitehead, jun., Sheffield; T. H. Whittaker, Nottingham; W. S. Willan, Kettering, Northants; H. H. S. Willey, Reigate, Surrey; A. G. Wilson, Tayport, Fifeshire; G. C. Wilson, Streatham, S.W.; C. R. Winter, Hucknall Torkard, Notts; N. Worsley, Blackpool; G. H. Yeoman, Streatham, S.W.; A. M. C. Young, Lambeth, S.E.

Intermediate: L. T. Moore, London; C. Batley, Brentwood, Essex; A. H. Lamont, Edinburgh; D. L. Solomon, London; W. Stockdale, North Shields; H. Shackleton, Keighley; H. W. Humphry, Bournemouth West; H. H. Golding, Woolwich, S.E.; O. H. W. Hillerns, Hessle, East Yorks.; A. H. Atkinson, Clapham Common, S.W.; E. C. M. Willmott, Cardiff; F. Dyer, Manchester; A. C. Goulder, Woodford Green, Essex; J. N. Horsfield, jun., Kingston-upon-Thames; W. Turpin, Sunderland, T. L. Dale, Marlborough, Wilts; E. B. Muff, Bexley Heath, Kent; P. B. M. Hope, Clapham-road, S.W.; F. W. Tempest, Sutton-in-Ashfield, Notts; R. A. Thomas, Southsea; H. C. Swindells, Fairfield, near Manchester; C. C. Durston, Weston-super-Mare; D. Bamford, Manchester; W.T. M. Barrett, Stoke-on-Trent; R. J. Buck, Horsham; Archibald Bullock, Streatham Hill, S.W.; H. Clay, Gainsborough; J. Cocker, Timperley; J. Davidson, Loughton, Essex; A. C. M. Edwards, Rickmansworth; D. A. Forster, Chertsey, Surrey; D. P. Hayworth, London; W. W. Hitchins, Plymouth; A. P. Hohnfeldt, Hull; C. E. Hewitt, Nottingham; T. F. Ingram, Wakefield; S. Jaques, London; R. Johnston, London; A. S. Killby, Highbury, N.; S. H. J. Murch, Loughton, Essex; J. Myers, Maida Vale, W.; L.W. Myers, Cambridge; W. E. Paterson, Cheltenham; G. E. Peto, Bath; A. P. H. Pierce, Hampstead, N.W.; A. H. Robinson, Birmingham; C. K. Roe, Kensington, W.; H. F. Tasker, Hampstead; A. N. Tucker, Plymouth; T. W. Watkins, South Kensington; A. F. Wickenden, Hull; J. A. Wilson, Bayswater, W.; C. W. Wood, London.

Exemptions from the Intermediate Examinations: The following Probationers who have attended the full two years' course in architecture at University College, Liverpool, and have obtained a first-class certificate at the College Final Examination, were, on the recommendation of the Board of Examiners, exempted from sitting for the recent Intermediate Examination, and have been admitted as Students R.I.B.A., the work done by them during the session having been approved by the Board as testimonies of study: L. Barmish, Birkdale, Southport; J. G. C. Birch, Chester; E. H. Honeyburne, Southport; J. N. Lewis, Waterloo, Liverpool; K. Cameron, Eccles, Lancs.

Final: H. W. Asman, Bradford; L. L. Bright, Nottingham · M. N. Castello, Sydenham Hill, S.E.; H. W. Cubitt, London; W. R. Davidge, London; W. J. Delbridge, Greenwich, S.E.; G. Dykes, jun., Glasgow; H. T. Fowler, Barrow-in-Furness; E. G. H. Gunn, Cricklewood, N.W.; H. A. Hall, Southgate, N.; W. Hemingway, Bolton; H. W. Hobbiss, Kensington, W.; F. G. Johnson, Hampstead, N.W.; J. S. Lee, London; H. B. Mackenzie, Cardiff; F. W. Newman, Hampstead, N.W.; H. M. Pritchard, Cardiff; T. H. Robinson, South Kensington, S.W.; A. Rollo, Westminster, S.W.; G. L. Russell, Hackney Common, N.E.; H. W. Stone, Taunton; J. J. Wood, Leeds.

Liverpool Cathedral.

Mr. William Woodward then directed attention to the proceedings of the two Assessors in the recent Liverpool Cathedral Competition, and moved the following resolutions:—

1. "That this meeting condemns the action of the Assessors in giving the first place in the final competition to a set of drawings which did not comply with the essential condition of the competition."

2. "That this meeting views with the greatest disfavour the action of one of the Assessors in allowing himself to be associated with the selected competitor in the carrying out of the work."

After discussion on the first resolution, the meeting agreed to pass to the second, which was eventually withdrawn by the proposer, who expressed himself satisfied with the explanation given.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring Gardens, Lord Monkswell, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend Battersea Borough Council 1,430*l.* for purchase of hydraulic press and erection of buildings; Bermondsey Borough Council 10,000*l.* for erection of working-class dwellings; Greenwich Borough Council, 2,200*l.* for construction of conveniences; Shoreditch Borough Council, 1,670*l.* for paving works; Southwark Borough Council, 36,000*l.* for purchase of a wharf; Stepney Borough Council, 17,930*l.* for purchase of property, and 5,895*l.* for street improvement. Sanction was also given to Camberwell Borough Council to a loan of 8,725*l.* for paving works, and St. Pancras Borough Council, 23,960*l.* for electric light installation.

Flooding of Premises.—The General Purposes Committee reported that at a conference of representatives of the Councils of the Metropolitan Boroughs of Battersea, Bermondsey, Camberwell, Deptford, Greenwich, Lambeth, Lewisham, Southwark, and Wandsworth, which was held on October 15th last, a deputation was appointed to wait upon the Council for the purpose of pointing out the danger to the health of the inhabitants which was likely to arise through the periodical flooding of their premises, and of urging the Council to take steps to deal with the question. The deputation was subsequently received by a joint meeting of the General Purposes and Main Drainage Committees on November 16, when it was informed that their representations would receive the most careful consideration of the Council in dealing with the question of providing relief for the districts affected at times of heavy rainfall.

The Closing of Great Queen-street.—In answer to Captain Swinton, Mr. Davies (chairman of the Improvements Committee) said that in connexion with the Holborn to Strand Improvement, and the tramway subway, it had been found imperative to close the portions of the public streets forming the junction of Great Queen-street with Little Queen-street for about three months, and not two years, as stated in the circular recently distributed by residents in the locality. A sewer in Great Queen-street would be intersected by the tramway subway, and this sewer had to be diverted into a sewer at a deep level, with which also the new sewers in the new street north of Great Queen-street had to be connected. The existing sewer and pipes in Little Queen-street had to be removed, the tramway subway had to be constructed, and also a subway for pipes and wires on each side of the tramway subway. To do that work the whole of the street had to be excavated, and it was impossible to keep any part of it open for vehicular traffic. The work was being pressed on rapidly, however, in order to allow the vehicular traffic to resume three months hence the use of the portions of the thoroughfares now closed.

Main Drainage: Crossness to Catford.—On the recommendation of the Main Drainage Committee, the estimate of 2,500*l.* in respect of the cost of borings and other preliminary expenses incidental to the construction of the Plumstead to Catford section of the proposed Crossness to Catford high-level sewer, was approved. It was agreed to invite tenders for the work.

Fire at Artillery Theatre, Woolwich.—The Theatres and Music Halls Committee reported as follows:—

"We have to report that our attention has been drawn to the destruction, by fire, on November 18, of the Artillery Theatre at Woolwich, and we think it well for us to state, for the information of the Council, the facts of the case so far as they can be ascertained, as an illustration of the necessity for the regulations which the Council has made with respect to the building of theatres and music-halls. The fire, which originated on the stage, was discovered shortly before 1 a.m., and by 6 a.m. the theatre had been quite destroyed. We are informed that the building was erected in the early part of last century, and for some years, it is understood, was used as a church, but for the last thirty-five years or thereabouts it has been used regularly for theatrical performances. The site was a good one, as the building was almost isolated, but the internal arrangements were such as would not be allowed in a theatre built under the regulations of the Council. The stage and auditorium were practically in one fire risk, the only separation between them being a screen of wood, plaster, and canvas, and the stage was enclosed by the dressing-rooms and stores for scenery and properties. The stage and auditorium were under one roof, and the premises were lighted throughout by means of gas. Hydrants were fixed in various parts of the house, but we are informed that the pipes with which they were connected were not charged with water, and that it was three-quarters of an hour before a proper supply could be obtained. Had there been a brick proscenium wall, fitted with an efficient fire-resisting screen such as is required for modern theatres, there is little doubt that the fire might have been confined to the stage."

Mr. Yates hoped it would not go forth that the Council had any responsibility at all in the matter of this fire, as this was one of those buildings which were expressly excluded from the jurisdiction of the Council by the Army Act, 1889.

Mr. Squires said that he had had the opportunity of seeing some of the people in authority at Woolwich, and had every reason to believe that in the event of the rebuilding of the theatre they would be quite willing to adopt the Council's regulations for the protection of theatres from fire.

Waldorf Hotel, Aldwych.—The Theatres and Music Halls Committee reported that they had considered plans submitted by Messrs. A. Marshall Mackenzie and Son, of the Waldorf Hotel, which it is proposed to erect in Aldwych. It is desired to obtain a licence for music for the grill room and the conference room in the basement, and for the lounge on the ground floor, and a licence for music and dancing for the masonic temple or dancing hall on the seventh floor. The grill room and conference room are shown to accommodate 400 people, the lounge 300, and the masonic temple 200. The Committee saw no objection to the arrangements, so far as regards the basement and ground floors if it be only desired to have music during meals, but they were of opinion that, as the room on the seventh floor will be about 85 ft. above the street level, it was not one which they could recommend the Council to allow to be used for the purpose mentioned. They recommended accordingly, and the Council agreed.

Holborn to Strand.—Sale of Land.—The Corporate Property, Charities, and Endowments Committee reported as follows:—

"We report that the sale, to the trustees of the Duke of Bedford, of the land on the northern side of Aldwych, between Catherine-street and Drury-lane, has been effected in accordance with the arrangements referred to in the report of the Improvements Committee to the Council on November 17, 1903, and that the sum of 79,952*l.* 8s. has been paid into the county fund."

Building Conditions.—The same Committee also reported to the following effect:—

"It will be remembered that at the auction held on October 13 last certain valuable plots in the Strand, Kingsway, and Aldwych were offered on lease, but no bids for them were made, and it is in consequence of this result that we have carefully considered whether the building conditions relating to the leasing of the Council's surplus land acquired in connexion with various improvement schemes should be modified, with a view to the letting of the land more expeditiously. As the conditions stand at present there is no provision made for arbitration. No. 13 of the conditions provides that in the event of any dispute arising between the Council and the lessee in connexion with the erection of the buildings such dispute is to be settled by the Council's architect, whose decision shall be final. The point, therefore, which

we have had chiefly to consider is whether any modification of the condition in question should be made so as to provide for an appeal to an independent arbitrator in the event of any failure of agreement between the Council and the lessee. We have made enquiries as to the practice which obtains in regard to the letting of land on the estates of the large ground owners of London, and we are advised that the conditions in force on these estates are generally more onerous than those imposed by the Council, and make no provision for arbitration. It does not appear that the Council's conditions have hitherto restricted building operations on its land, and we are of opinion that the inability to dispose of more surplus land is not due to the conditions, which have been practically the same for many years past. We are further informed that while the standard of work insisted upon is sufficient for its purpose, the Council does not press this beyond what is believed to be consistent with the circumstances of the case. That the tendency is towards leniency rather than the strict letter of the conditions is in a measure confirmed by the large increase in the building work on the Council's land.

We may remind the Council that on May 26 last, when reporting on the question of the elevation of the buildings to front on the Strand, Aldwych, and Kingsway, we recommended that, in the event of disagreement, the lessee should be allowed to consult with certain architects with a view to his submitting an amended design, and that should the amended design not be approved, the designs should be submitted to the Senior Architectural Academician for his decision. The Council did not adopt our recommendation, but decided that the design should be such 'as the Council should approve as worthy of the position'; thus, in effect, allowing no appeal against its decision.

During our consideration of this matter we received a memorandum from the Finance Committee asking to be furnished with estimates of the probable recoupment that may be anticipated by the letting of the surplus land in connexion with the Holborn to Strand improvement; calling attention to the existing burden on the ratepayers on account of the expenditure on the improvement, which can only be lessened by the letting or sale of the surplus land; and asking us to consider without delay as to the best method for ensuring the early disposal of the land on satisfactory terms. After careful consideration, we are of opinion that, although there were no bidders for the plots of land in connexion with the Holborn to Strand improvement at the last auction, the Council will not experience any difficulty in eventually disposing of the plots under the existing conditions. We are, however, impressed with the point raised by the Finance Committee, as to the desirability of securing a speedy recoupment in connexion with the improvement, and we think the Council will be well advised to make some concession so as to facilitate the letting of the surplus land. We propose, therefore, that condition No. 13 referred to above should be modified so as to provide for arbitration on any matter not provided for by the plans and specifications, after the plans and specifications have been approved. We do not ask the Council to fix the exact terms of the clause, because the drafting of the building conditions has been left in our hands, but if the Council adopts our recommendation it will become our duty to give effect to its decision in all future building conditions drawn up in connexion with the letting of the Council's surplus land.

We recommend that condition No. 13 of the building conditions attached to the leasing of the Council's surplus lands in connexion with improvement or other schemes be modified, so as to include therein the following provision:—If and so often as the same shall happen, any dispute shall arise after the plans and specifications have been approved between the Council and the lessee as to any matter connected with the erection of the said building or buildings, or the foundations or drainage thereof, or the preparation, laying out, fencing, or otherwise dealing with the said land, which matter is not provided for by 'the approved plans and specifications,' or any additions to, alterations in, or omissions from the same authorised as aforesaid, or by these conditions or conditions of approval, every such dispute shall, if the parties do not agree, be decided by an arbitrator, appointed by the President of the Royal Institute of British Architects, whose decision shall be final."

This gave rise to considerable discussion.

Mr. Piggott said that in regard to the arbitration clause, it should be generally known that an alteration had been made which was generous to those who took the Council's land.

Mr. H. Ward said he was afraid that Mr. Piggott had not understood the effect of the alteration. The Architect to the Council had still to approve; arbitration might ensue afterwards. What builders complained of was still in the conditions.

Mr. Leon said it was the opinion of the valuer that an independent arbitrator should be allowed to act. Until that was permitted, the Council was not likely to dispose of its land in the way it desired. He was sorry that a more satisfactory change had not been made. Although private owners did not allow arbitration by contract, yet, when there was any dispute the large owners permitted it.

Mr. Howell J. Williams said he was glad that a concession had been made in regard to the arbitration clause, but Mr. Ward had already indicated that the concession did not go far enough. The arbitration clause should be final, and refer to everything that might be in dispute. The Council ought to encourage people to take up plots quickly, for it was the object of the Council to develop as quickly as possible the Holborn to Strand estate. There was no reason why the Council should perpetuate the eighty years' system, and it would be well to give people some continuity of tenure, and be prepared to extend the term at the end of ninety-nine years. In regard to low-lying land, it seemed to him extraordinary that having let any one a piece of land they should demand that permission be obtained to build upon it.

Mr. J. Burns, M.P., supported the Committee, but Mr. E. White said he thought they had not gone far enough.

After further discussion, the recommendations were agreed to.

Tramways.—The following recommendations of the Highways Committee were agreed to:—

"(*a*) That the underground conduit system of electrical traction, approved by the Council on November 10, 1903, for the construction of the new tramways along St. John-street, St. John-street-road, and Rosebery-avenue, be adopted for the reconstruction of the first sections, about 22¼ miles in length, of the Council's (Northern) tramways.

(*b*) that the drawings of the system of electrical traction proposed to be adopted by the Council in connexion with the reconstruction of the 22¼ miles of tramways referred to in the foregoing resolution, together with a statement of the materials to be used in such reconstruction, be submitted, when ready, for the approval of the Board of Trade, as required by the London County Tramways (Electrical Power) Act, 1900."

Taxation of Land Values.—Dr. Napier moved:—"That the Council refers to its resolutions of March 18, 1902, relating to the equalisation of rates, and of March 4, 1902, relating to the taxation of land values, and is of opinion that the time has arrived when, in the interests of London ratepayers, these two subjects should again be brought before Parliament without further delay.

Mr. H. P. Harris moved an amendment to the effect that the question of what proposals for the equalisation of rates should be laid before Parliament should be considered by the Local Government and Taxation Committee, who should be asked to submit a scheme on the subject; and that, in view of the ever-increasing charge on the London ratepayers, the Government be invited to take into immediate consideration the proposals contained in the Report of the Royal Commission on Local Taxation for the relief of rates, and to introduce measures of reform without delay.

Colonel Rotton seconded the amendment, which, on a division, was negatived by 59 votes to 17; and, upon a division, the motion was carried by 58 votes to nine.

District Surveyors and Salaries.—The following notice of motion has been placed upon the agenda paper by Mr. Dew:—

"That it be referred to the Building Act Committee to report whether it is advisable that the Council should exercise the powers, conferred upon it by section 158 of the London Building Act, 1894, to pay fixed salaries to the district surveyors instead of their being remunerated, as at present, by fees; with due regard to the statutory responsibility of the district surveyors for the stability of buildings, etc., being in no way lessened."

The Council adjourned at 6.30 p.m.

New Entrance, Bushey Park.—In response to representations made to them, his Majesty's Board of Works have consented to the erection of a new entrance into Bushey Park at Hampton Court, which will consist of a cradle gate for foot passengers and a larger gate for vehicular traffic. It will be constructed near to Hampton Court Green.

DISTRIBUTION OF RAINFALL IN THE BRITISH ISLES.

The following is a *résumé* of the paper on this subject read before the Institution of Civil Engineers on the 24th ult., by Mr. Hugh Robert Mill, D.Sc., LL.D.

For the purpose of discussion of the subject the author had employed the large collection of records of rainfall brought together by the late Mr. G. J. Symons. The record of rainfall kept up for seventy consecutive years at Chilgrove, Nash Mills, Orleton, Boston, and Kendal were discussed so as to compare the mean rainfall of various periods with that of the whole. The averages of the variations of the means of all possible groups of ten, twenty, thirty, and forty consecutive years from the mean of the whole, expressed as a percentage of that mean, were as follows:—

10 years.	20 years.	30 years.	40 years.
4·7	3·4	2·2	1·7

The mean of thirty years thus appeared to be subject to very little more variation from the mean of seventy years than was the mean of forty years; and therefore a period of thirty years was sufficient to give a close approximation to the mean rainfall of a much longer period. It was also shown that the thirty years, 1870 to 1899, gave, on the whole, a mean rainfall nearer to the true mean in all parts of the country than any other group of thirty years available for the purpose.

The 380 stations yielding perfect records for the thirty years, 1870 to 1899, were not sufficiently uniform in their distribution to serve as the basis of a rainfall map, and were therefore supplemented by the records of 668 stations, which were complete for at least twenty years out of the thirty, these values being reduced to the equivalent thirty years' means by the usual method. A very few shorter records, also reduced to the thirty years' means, were used for parts of Scotland and Ireland. The accuracy of the individual records was secured by using only those which had been tested and published in "British Rainfall" year by year, and also by the critical examination of the figures as set out in their proper places on a map.

Isohyetal lines, or lines of equal rainfall, were drawn upon the map strictly in accordance with the figures, and without making any use of any hypothesis, *e.g.*, as to the effect upon rainfall of the height or exposure of the land. These lines were drawn for every 5 in. of rainfall up to 40 in., for every 10 in. from 40 to 60, and for every 20 in. for higher falls. With the exception of a few small specified areas, the resulting map gave as full and accurate information regarding the distribution of mean annual rainfall over the British Isles as its scale admitted. Its value lay in that it was based exclusively on definitely ascertained facts of observation, so that it might be used for the purpose of deducing the relation of rainfall to the altitude and configuration of the land, or to any other physical features.

The map showed that a mean rainfall under 25 in. occurred in three places:—(1) a very narrow strip round the Moray Firth, (2) a triangular area about the Thames estuary, and (3) a large portion of east central England south of the Humber. A rainfall between 25 and 30 in. prevailed over more than one-third of the surface of England, occupying the whole centre of the country, also over a strip along the east coast of Scotland, and in a small patch around Dublin. The rest of Scotland and Ireland received more than 30 in. of rain, and more than 30 in. also prevailed in four large and several small isolated portions of England. The larger of these were:—(1) the whole north-west of England, including all the land more than 500 ft. in elevation from the Scottish border to beyond Derbyshire, (2) all Wales, together with a strip of the bordering districts of England, (3) the peninsula of Cornwall and Devon, with prolongations eastward along the Cotswold Hills, along the Marlborough Downs, and over Salisbury Plain, and (4) the higher land and the edges of the plain to leeward of it in the Weald district of Kent, Surrey, and Sussex. The smaller patches of rainfall over 30 in. occurred on the Cleveland Hills, the North York Moors, and the Yorkshire and Lincoln Wolds. In all these cases there was a distinct, though not an identical, relationship between the amount of rainfall and the height and configuration of the land.

The parts of England receiving a rainfall of 40 in. and over included (1) the Lake District, with the east of Lancashire and the west of the North and West Ridings of Yorkshire, the

centre of maximum fall exceeding 100 in. around Seathwaite; (2) the whole of Wales except Anglesea, culminating in an area with over 100 in. round Snowden; and (3) almost all of the peninsula of Cornwall and Devon, centres of heavier fall occurring on Exmoor, Bodmin Moor, and Dartmoor.

The data were rather less satisfactory for Scotland and Ireland. In Scotland it was clear, however, that a rainfall over 40 in. was confined to the western half, the maximum (which exceeded 80 and sometimes 100 in.) occurring in the Western Highlands, but not extending to the coast, except, perhaps, in Skye. In Ireland, the mountain groups of the east, and the whole of the country west of the Shannon and the Foyle, received more than 40 in., and the fall exceeded 50 in. in the west of Kerry, Galway, and Mayo.

While a distinct relation appeared between the amount of rainfall and the configuration of the land, taken in conjunction with its elevation and exposure, the author thought that no definite numerical relation between amount of rainfall and mere height above sea-level could be made out.

The average annual rainfall had been calculated by measuring the areas between successive isohyetal lines on the map; multiplying the area of each zone by the average fall within it estimated from the figures on the map, adding all the resulting volumes together for each of the great divisions, and dividing by the total area of each.

The extremes of annual rainfall were discussed by taking out the figures for the driest and wettest year of the period 1870-99 from the records of 290 stations, selected so as to be as nearly as possible uniformly distributed over the country. At 145 of these stations 1872 was the wettest year, at 92 stations 1887 was the driest year, no other year having anything like so many extremes in either case. The average of the wettest years at all stations was 3·5 in. higher than the average of the year 1872 at the same stations; the average of the driest years was similarly 2.5 in. lower than the average of 1887. It is shown that 1872 was probably the wettest and 1887 probably the driest year of the nineteenth century for the British Isles as a whole. Rainfall maps of 1872 and 1887 were prepared, and found to show a relative distribution of rainfall substantially similar to that for the thirty years' mean.

The average rainfall of each of the two years had been calculated from the maps for each of the great divisions, and the results, to the nearest ½ in., together with that for the thirty years' means, were as follows:—

Period.	England.	Wales.	Scotland.	Ireland.	British Isles.
	in.	in.	in.	in.	in.
Mean 1870-99..	31·5	49·5	47·0	42·0	39·5
Year 1872	45·0	74·0	62·5	52·0	53·0
Year 1887	23·5	36·5	39·5	33·0	30·5

The excess of rainfall in 1872 was 34 per cent., and the deficiency of rainfall in 1887 was 23 per cent. of the average fall for the British Isles as a whole. The rainfall of 1872 for England and Wales was almost exactly double that of 1887.

BUILDING BY-LAWS REFORM ASSOCIATION.

At a meeting of the Council of this Association, held at 45, Parliament-street, Sir Wm. Chance in the chair, the following resolutions were passed unanimously:—

"1. (*a*) That a Bye-laws* Committee, to consider and report on the amendments needed in the existing bye-laws be, and is hereby, appointed, consisting of the following members: Mr. W. M. Acworth, Lord Robert Cecil, Mr. A. H. Clough, Mr. A. Graham, Mr. W. Henman, Mr. Mark H. Judge, Mr. E. L. Lutyens, Mr. Arthur Newbold, Dr. G. V. Poore, Mr. H. A. Powell, Mr. Lacy Ridge, Mr. R. W. Schultz, Mr. J. St.-Loe Strachey, Mr. E. D. Till, Mr. Thackeray Turner, Mr. C. Turnor, Mr. H. G. Willink, the Hon. Percy Wyndham, together with the Chairman and Honorary Secretary.

(*b*) That the Report of the Special Committee appointed on May 14 last, as adopted by the Council, be referred to the Bye-laws Committee with a view to the work being continued on the lines therein laid down, especially as regards the following points:—

(i.) For the purpose of securing, with as little delay as may be, some relief from the more oppressive of the Bye-Laws now in force in rural districts, the Committee to approach the Local Government Board and endeavour to secure their publishing a new set of Model Bye-Laws for these districts embodying amendments which the Committee may suggest to the desired end. Further, to urge District Councils to amend existing Bye-Laws accordingly.

(ii.) Following on the above, to prepare a set of Draft Building Bye-Laws carrying out the recommendations of the Special Committee that 'the Bye-Laws should lay down principles' and that 'each Bye-Law should provide that, unless the principle it enunciates is otherwise given effect to to the satisfaction of the local authority, it shall be considered to be given effect to if the requirements set out in the Schedule to the Bye-Law are complied with."

(iii.) As soon as practicable, to deal with the Bye-Laws of Urban Districts in like manner.

2. That the above Resolution be forwarded to the members of the Association in a circular letter, requesting them to inform the Bye-laws Committee of any cases of hardship under existing bye-laws, and asking them to make the Association known to their friends, in order that the number of members may be increased as much as possible before the annual meeting in February next."

* The spelling "Bye-Laws" is that adopted by the Association and therefore we give it in quoting the words of their resolution; but we decline to adopt it.

SANITARY LAW.

The third meeting of the session of the Institute of Sanitary Engineers was held on Wednesday evening, at 19, Bloomsbury-square, W.C., under the chairmanship of Mr. Dove.

Mr. H. Harcourt Verden (of Davies and Verden, solicitors) read a paper on "Sanitary Law," in the course of which he said that the law relating to sanitation being of a complicated and intricate nature, it was only possible for him to dwell upon the points of the utmost importance to sanitary engineers in the ordinary course of their profession. There was no doubt that many volumes could be written on this important branch of the law. He would divide his paper into two parts, the first dealing with the law relating to sanitation as laid down by statute, and, secondly, the law relating to sanitation as settled by the courts. With regard to the first point, the important Act was of course the Public Health Act of 1875, which, with its amending Acts, formed the basis of their sanitary laws. Mr. Verden proceeded to deal with Part 3 of the Act, which deals almost exclusively with sanitation, and which defines what are drains and what are sewers. The definition of a drain and a sewer was the same under the Metropolis Management Act as under the Public Health Act, with the qualification that the word "drain" also includes a drain for the draining in groups or blocks of houses by a combined operation under the order of any Vestry or District Board. The definition of a sewer does not include a cesspool, reservoir, or deposit bed for collecting sewage for purposes of disposing of it. Having referred to the different sections of the Act, the speaker went on to glance at the amending Acts and their chief objects, viz., (1) the Housing of the Working Classes Act, 1890; (2) the Private Streets Works Act, 1892; (3) the Local Government Acts of 1888 and 1894; and (4) the Factory and Workshops Act, 1895. He considered that these statutes were useful to sanitary engineers and architects on many occasions, and he strongly advised those gentlemen who had not studied these Acts to do so at their leisure. The most important branch however, of sanitary law, so far as sanitary engineers and architects are concerned, was undoubtedly that which was laid down and settled by the Courts of Law and known as case law. He had been carefully through some hundreds of interesting cases, all of which were more or less important, and he had had great difficulty in sifting out the most important of them, from an engineer's point of view. In the case of the Hornsey Local Board v. Davis (Court of Appeal, 1893) the local authority had duly accepted a sewer made in a private road, which, although it had no outfall, was at the time of acceptance incapable of being used as a sewer. It was held that the road had once been sewered to the satisfaction of the local authority; the expense of constructing a new and more efficient sewer was not chargeable on the frontagers. In the case of Vowles v. Colner (1895) Vowles was a landowner who made a sewer in the half of a road adjoining his land, which he disposed of in building lots, charging the purchaser for connecting the drainage of their premises with his sewer. Colner, who had a house on the other side of the road, connected his drain with Vowles' sewer. It was held by Lord Justice Romer that Vowles was not entitled to an injunction to restrain Colner from connecting with the sewer. With regard to sewers and drains passing through private ground it has been held that a drain passing through private ground but receiving the drainage of more than one building is a sewer within the meaning of Section 4 of the 1875 Act (Treves *v.* Utley). Rather an interesting point cropped up in the well known and important case of Hill v. Hair (1895), where adjoining houses were, previous to 1848, drained by a brick construction on A's land, which conveyed the drainage into an adjoining ditch; in 1853 a public sewer was laid down in place of the ditch, and the brick construction was connected with it. It was held that the brick construction was not a single private drain, but had become a sewer vested in the local authority and responsible by them on the passing of the Public Health Act, 1848. The question had not been before the Court of Appeal, although it was disapproved by the Divisional Court in Bradford v. Eastbourne Corporation. Under Sec. 16 of the Act of 1875 a local board proceeded to carry a sewer across the plaintiff's pleasure grounds on such a level that the bottom of the sewer would be only slightly below the surface, and a permanent embankment about six feet high would be made. It was held by the Court of Appeal that the Board were authorised to do so, for that the Act did not confine them to carrying a sewer underground (Roderick v. Aston Local Board). In the case of Swanston v. the Twickenham Local Board it was decided that a manhole is part of a sewer, and may be made without purchasing land for the purpose, the owner of the land being only entitled to compensation for the damages arising from making it. With regard to the question of lateral support, although the Local Board may make the sewers, they do not, as it seems, from Metropolitan Board of Works v. Metropolitan Railway, acquire any right against the owners of adjoining lands to a lateral support. This therefore must be purchased if it is considered to be requisite. A case of much interest was the Tynemouth Rural District Council case. Here an owner of land in a rural sanitary district, who proposed to lay it out as a building estate and to erect on it blocks of houses arranged in streets, deposited with the local authority plans of the proposed buildings, from which it appeared that each of the houses was to be drained with a separate drain, ending in the middle of one of the proposed new sites. The local authority refused to approve the plans unless the owner would undertake to construct at his own expense the sewers with which the drains were intended to communicate, and also the necessary main outfall sewer. It was held that the local authority were not entitled to attach such a condition to their approval. Mr. Verden next dealt with the question of nuisances and dilapidations, with regard to which he said the books were full of the law. He quoted the decisions in the cases of "Lyon *v.* Greenhorn" and "Smith *v.* Robinson," and said it had been held that drainage expenses are not repairs unless the agreement specifically states that they shall be. Any contract whereby the parties agree that a certain sewer shall be called a drain for their own purposes, and to take themselves out of the Act, is invalid. In conclusion, Mr. Verden said he would read six important points which practically was an outline of sanitation well summarised, if he might use the expression:—(1) The District Council is required to cause to be made such sewers as are necessary for effectually draining their particular district; (2) owner or occupier is entitled to connect with any sewer, on condition that he gives notice to comply with the Council's regulations, and subject to control by Council's appointee; (3) every owner without the district has the same rights, subject, however, to such conditions as may be agreed to or settled by law and arbitration; (4) if a house has no sufficient drain, the occupier may be required to provide one, and to discharge into sewer if there is one within 100 ft., or otherwise into a cesspool, as Council may direct; (5) new houses in urban districts must have sufficient drainage as the Council requires; and (6) in an urban district no building is to be newly erected over a sewer without Council's consent first being had and obtained.

Considerable discussion followed on the reading of the paper, and Mr. Verden answered a number of questions put to him.

Mr. Cecil moved a hearty vote of thanks to the reader of the paper, and said he thought the Institute ought to express an opinion as to

the necessity for some codification and simplification of the sanitary laws of the country.

Mr. Smith seconded the motion, and it was supported by the chairman, and heartily agreed to

Illustrations.

CHRIST CHURCH, NORTH BRIXTON.

IN our issue of November 22, 1902, we published a plan and description of this church, and a drawing of the exterior of the chancel.

We give here illustrations of the exterior from the western point of view, and an interior of the chancel, showing the pulpit and lectern and other details, including the method of inscribing the Commandments on the wall-spaces, instead of enclosing them in a special frame or tablet. Whether this is or is not preferable from a decorative point of view may perhaps be a question; it certainly has the advantage of rendering them more legible to the congregation, should any of them have the misfortune to be ignorant of the Decalogue.

To the information given on the former occasion it may be added that the internal oak fittings of the chancel have been carried out by Mr. A. Webber (the general contractor) and by Messrs. Farmer and Brindley and Mr. J. E. Knox; and the lettering on the walls is by Mr. E. Johnston.

Professor Beresford Pite is the architect.

MAESYCRUGIAU MANOR, CARMARTHENSHIRE.

This house is in course of erection upon the site of an older one now pulled down. It is built of local stone, the roofs covered with local slates, and the marble work is also of local production. The drawing was in this year's Royal Academy Exhibition. The contractors are Messrs. Stephens and Bastow, of Bristol, and the architect is Mr. Arnold Mitchell.

PROPOSED HOTEL, CHURSTON, DEVON.

This elevation, by Mr. G. B. Carvill, was exhibited at the Royal Academy some time back, and we commented on it at the time as a praiseworthy endeavour to treat a hotel in a simple and unpretending manner, without the element of showy architectural embellishment which generally characterises hotel architecture, and is apparently supposed to constitute a kind of advertisement.

The original drawing was a small one, but larger than this reproduction, so that the memorandum "$\frac{1}{8}$ in. scale" on the corner of the plate is of course incorrect in its present form. As we have often said, it is always better to draw out a scale on a drawing than merely to write on it what scale it is.

PORTION OF A DESIGN FOR MUNICIPAL BUILDINGS.

This drawing was prepared from a design submitted in competition for Darlington Municipal Buildings, and was exhibited at the Royal Academy in 1898.

One of the Yorkshire sandstones was proposed for the walls, with red tile roofing, the windows being glazed, with leaded lights.

Thomas Davison.

A COMPARISON OF ENGLISH AND AMERICAN METHODS IN THE ERECTION OF BUILDINGS.

A meeting of the Institute of Builders was held on Tuesday evening in the hall of the Society of Arts, John-street, Adelphi, W.C., when a paper on English and American Methods of Building was read by Mr. Charles Heathcote, F.R.I.B.A., of Manchester.

Mr. W. F. King, President, occupied the chair, and briefly introduced the lecturer.

Mr. Heathcote said: We have met together this evening to consider, in comparison with our own, the methods adopted by our cousins across the water in the erection of buildings, and to gather therefrom anything useful to ourselves. I am not dealing closely with the constructional designing of buildings although that has considerable bearing upon our subject, but with the methods adopted by the erectors of the work. In any references to "English" or "American" it must, please, be distinctly borne in mind they are not personal, but are solely made in general terms of either as a nation. As in architecture or in sculpture when we refer to the beauties and skill of the ancient Greeks we do not imply there were no instances of bad Art produced by them in the same era, so when speaking of the pushfulness of the American it is not to infer it a universal possession, or, on the other hand, to imply that all Englishmen lack great energy, which would be ridiculous. I speak of each only as a body—as a nation. . . . .

It is a healthy exercise, and if the advent of Americans into our local business enterprises universally results in this their coming is not to be regretted. But in the Press, or elsewhere, only one superiority in building matters has been claimed by or for the Americans—the claim of speed. In the most picturesque of the Press comments no claim has been put forth for better work, better finish, less settlement of walls, less cost, or any other advantage over the English contractor than the one of acceleration of speed in the erection of the work. It is an important claim, however. Is it a just one? In my opinion it is, only qualified by the remark that, all other things being equal, it has been an exaggerated claim.

What are the methods adopted by the Americans which are not in general vogue with English contractors whereby this acceleration is obtained? Several factors are necessary, and in a parenthesis it may be added that there are many Englishmen possessing every one of them, who have worked with them in full play, achieving much, although, like Englishmen, they have done so quietly, quite oblivious of the fact that they were doing anything deserving special comment or in any way out of an ordinary quick, bright, business life. But my point is this, that these speeding-up qualifications are not as widespread amongst us as with the Americans. Again cautioning you I am only referring generally, and not individually, let me come at once to the "practical politics" and give you a summary of these factors of successful rate and progress. The American is:—

Firstly.—More keen upon his work than we are. Of him it cannot be said, as of some Englishmen, that his business occupies his spare time. It is more true of him than of us that business comes first and pleasure afterwards.

Secondly.—The American architect is more generally alive to rapid completion of the drawings and details of the approved scheme in order to enable the contractor to know at the start virtually the whole of what he has to do. He also, if the work is such that it can be introduced, schemes his construction in such a manner that quick speed is attainable. Coupling-up steel stancheons tends to more rapid progress than endeavouring to provide polished granite from a Scotch quarry in winter.

Thirdly.—Based on being provided with the drawings, the contractor is enabled to perfectly organise his work. Every contractor here will know the extreme benefit and help this is to him, and would appreciate always being provided with early full settled information, clear and definite.

Fourthly.—This is one of the principal factors, if, indeed, it be not *the* principal one. Why should American architects work early and late, employing wider assistance to enable them rapidly to complete their drawings and instructions? Why should the American contractor spend much more on superintendence, on labour, on overtime, on earlier delivery of material? They do it because the American proprietor, more fully appreciative of the fact that the rapid building of his works means money to him, is willing to pay the necessary additional expenses such services involve. It is a pecuniary advantage to him, and he does not hesitate to pay in order to gain it. By his paying for it the costs of the acceleration are met, and the incentive provided for the greater exertion on everyone's part.

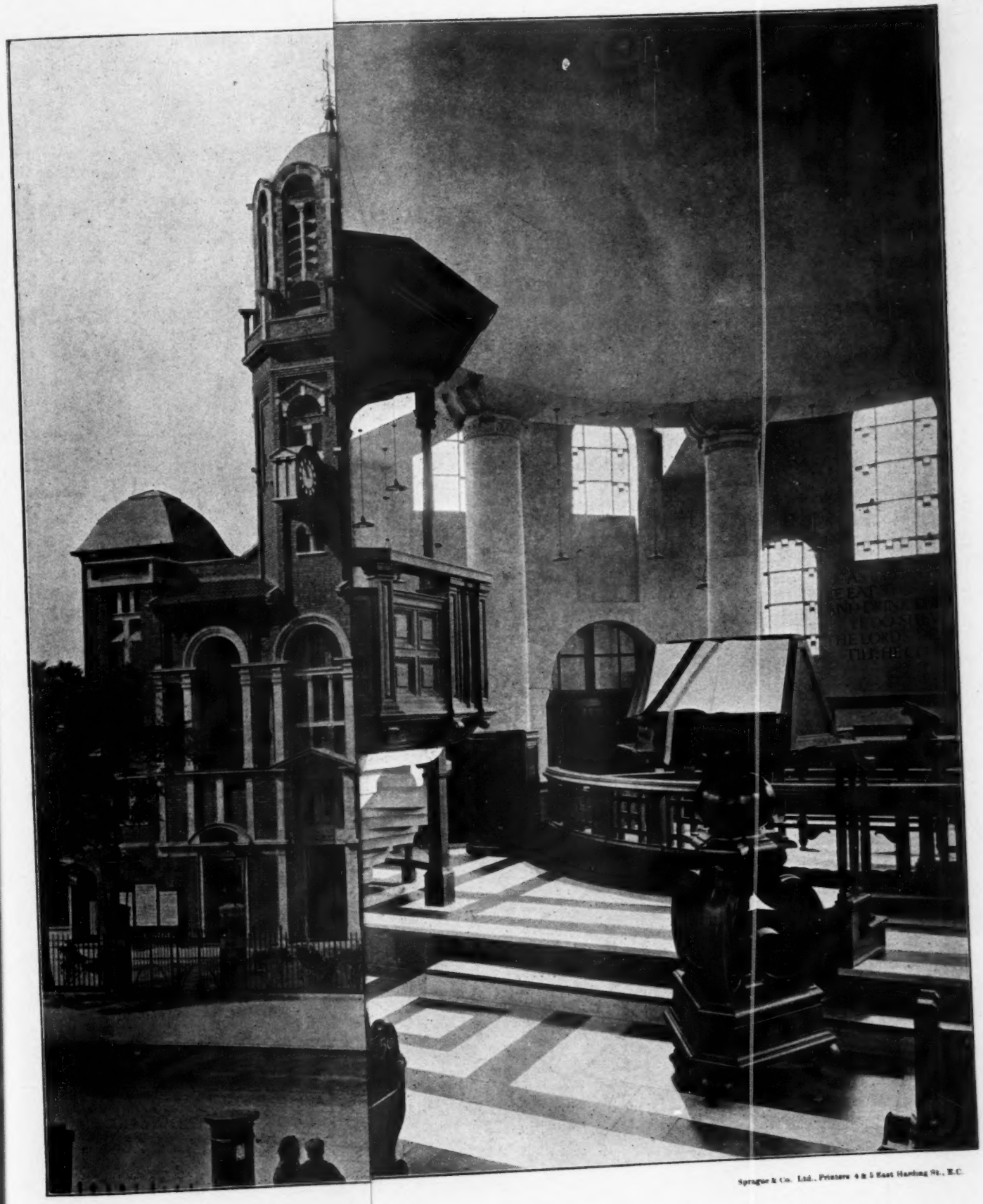
Fifthly.—The American values more the power of work in his employees than the amount of the minimum wage, and to save time will more eagerly seek the latest hoisting and other machinery. The attitude of the working man is also in his favour. An American workman seems to recognise that the more cheaply an article can be produced through economising labour the more the trade as a whole will be benefited, and, as a natural result, the labouring classes must be also. I have seen the matter expressed thus: "We know we are the gainers in the end if a new machine is introduced which does the work of ten men by the help of one. American employers always pay better wages to the men employed in their labour-saving machinery, and this has a tendency to advance wages all round, and find more and more employment."

On the other hand, it seems to be the deliberate suicidal policy of some trades unions in our country to compel their members to do as little work as will pass muster. This is a hard saying, but letters to this effect to the *Times* failed in getting any denial from the Union leaders. I should like to know this was a mistaken impression. It does not obtain, however, so much in the provinces at the present time as it did five years ago.

In this summary you have the whole matter. It is application and devotion to work, with profit as the incentive and reward. Let us deal with these factors in greater detail, and not to be too conservative, too splendidly isolated, too sensitive, to benefit from them. An American is keenly alive to the necessity of work, thought, application in his business. The American air seems to exert upon him a stimulation to new exertions and fresh enterprise. Add to this the great incentive of self-interest in the object to be attained, and you have the most potent of causes working in him. These direct him to the provision of everything to save time. Anything tending to this direction is worthy his consideration.

He commences his business education early. The system of education of the youth of America is founded more with the object of the ultimate business life than is ours. It is of more importance with him to know the history and to study the causes of American industrial progress than to be imbued with the knowledge of a dead language. The American University takes more the direction of a Technical Institute than it resembles our ideas of higher education. A youth is expected and directed to go through this course, which is a considerable portion of his actual business training. He is in his early manhood being properly fitted for his career, and his interest is thus bent towards his business pursuit. He has every opportunity for being trained in the right direction. Technical education implies in teaching some concern for the practical prospects of those taught. Practical experience goes with the theoretical. An American, by a common-sense education, does not enter upon his trade with a suspicion he is demeaning himself. Hopeful enterprise is the spirit in which he begins; he believes in the thing he has to do, and is proud of it. Can this be said to be the general drift of our higher educational systems at present?

It must be remembered America is a huge new country, and for a century there have necessarily been continually new developments, widening industries to meet the needs of an increasing population still further enlarged by constant immigration, and consequent urgent demands in ordinary times for labour and material of every kind in building operations. These young industries were fostered by Protection. The price of the nation's manufactures and the wages of the people continually increased. The cost of home productions being thus generally enhanced, the absolute necessity arose for the seeking and adoption of every feasible method for the reduction of that cost if trade were to be increased at home, and still more if there were to be any weighty business in exporting manufactured articles to a country where Free Trade at any rate kept down their cost. Necessity was again the mother of invention. The natural outcome with an energetic people was the introduction of labour saving machinery. For this competition labour saving machinery was not the only thing needed, but improvement in the manufactured article where such could be obtained. The necessity found the incentive and motif, without which nothing important will be done. Similar results follow here where necessity has driven home the incentive. For the moment some of our trades have been overtaken, but in many all efforts have been in vain to exceed the excellence of our manufactures. Great Britain is still easily first in certain textiles and textile machinery. No other country can approach the productions of Lancashire and Yorkshire. Recent indiscriminate eulogies of almost everything foreign compared with our own work and methods have given a very erroneous impression. It has become the fashion to so depreciate ourselves that people are beginning to believe it. An American, on the other hand, makes a point of praising his own country on every possible opportunity.



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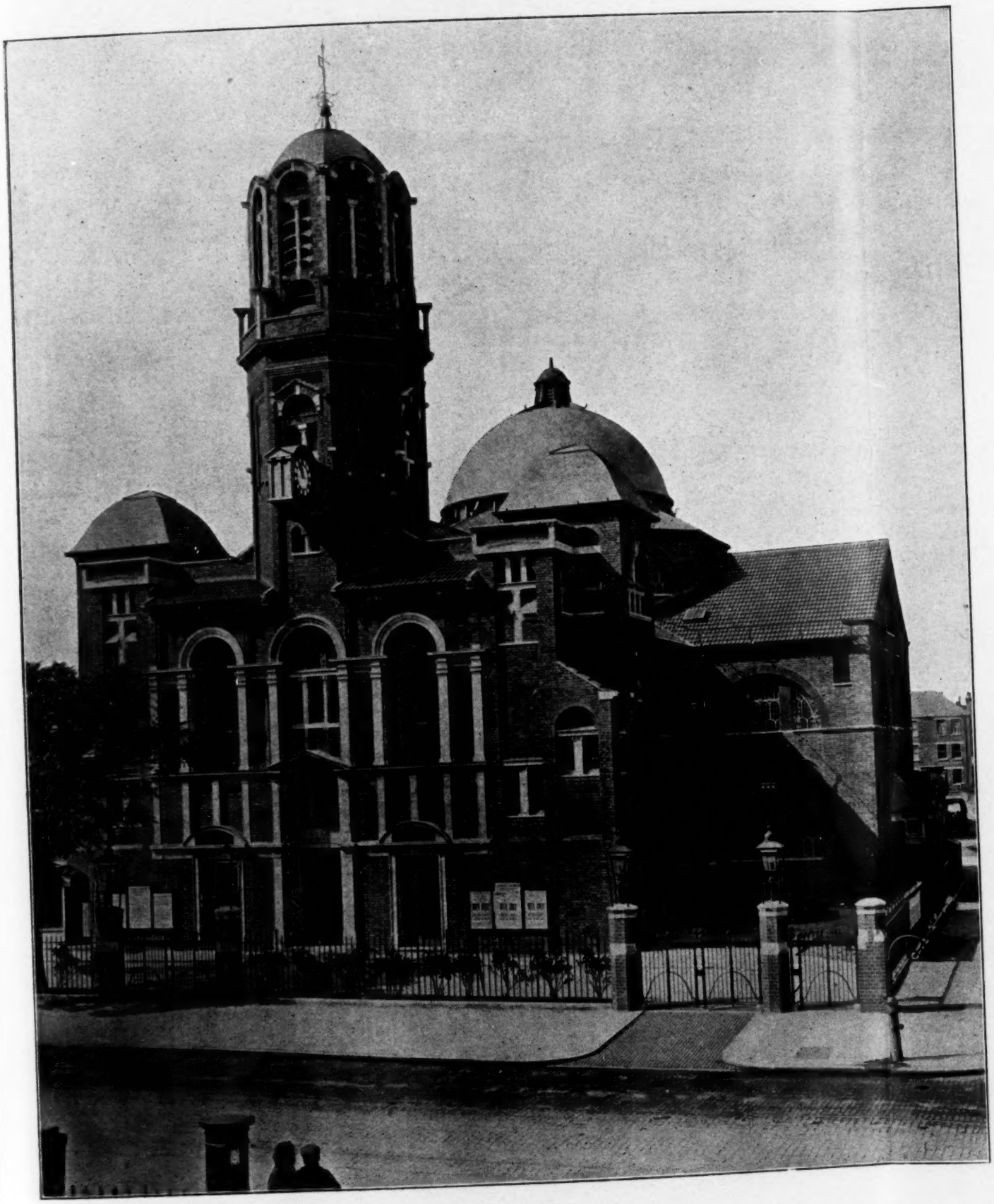

CHRIST CHURCH, NORTH BRIXTON.

IV. REMEMBER THE SABBATH
SHALT THOU LABOUR AND
THOU HAST TO DO: BUT THE SE
DAY, IS THE SABBATH OF THE LORD THY
GOD. IN IT THOU SHALT DO NO MANNER
OF WORK, THOU AND THY SON AND THY
DAUGHTER, THY MANSERVANT AND THY
MAIDSERVANT, THY CATTLE, AND THY
STRANGER THAT
FOR IN SIX DAYS
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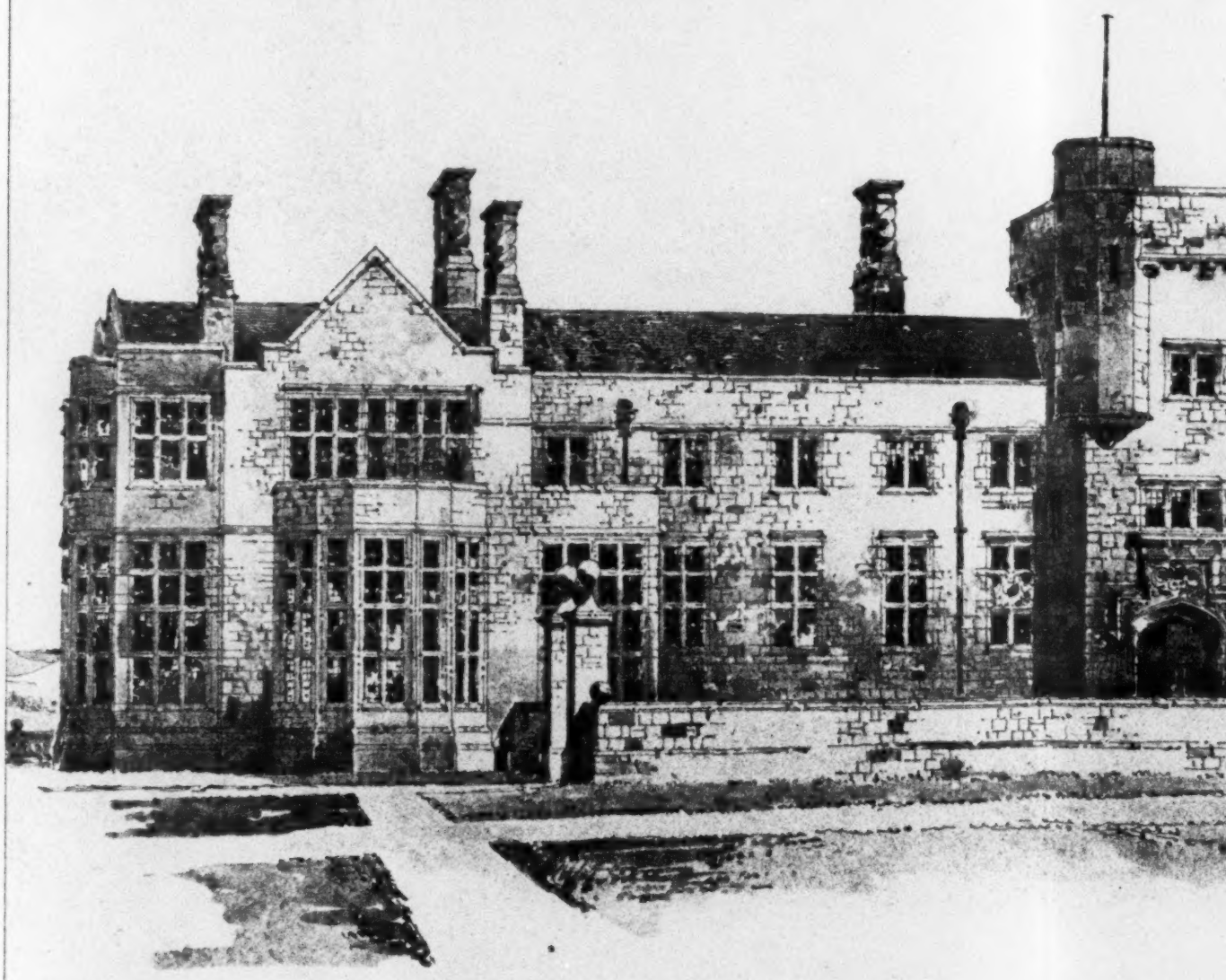
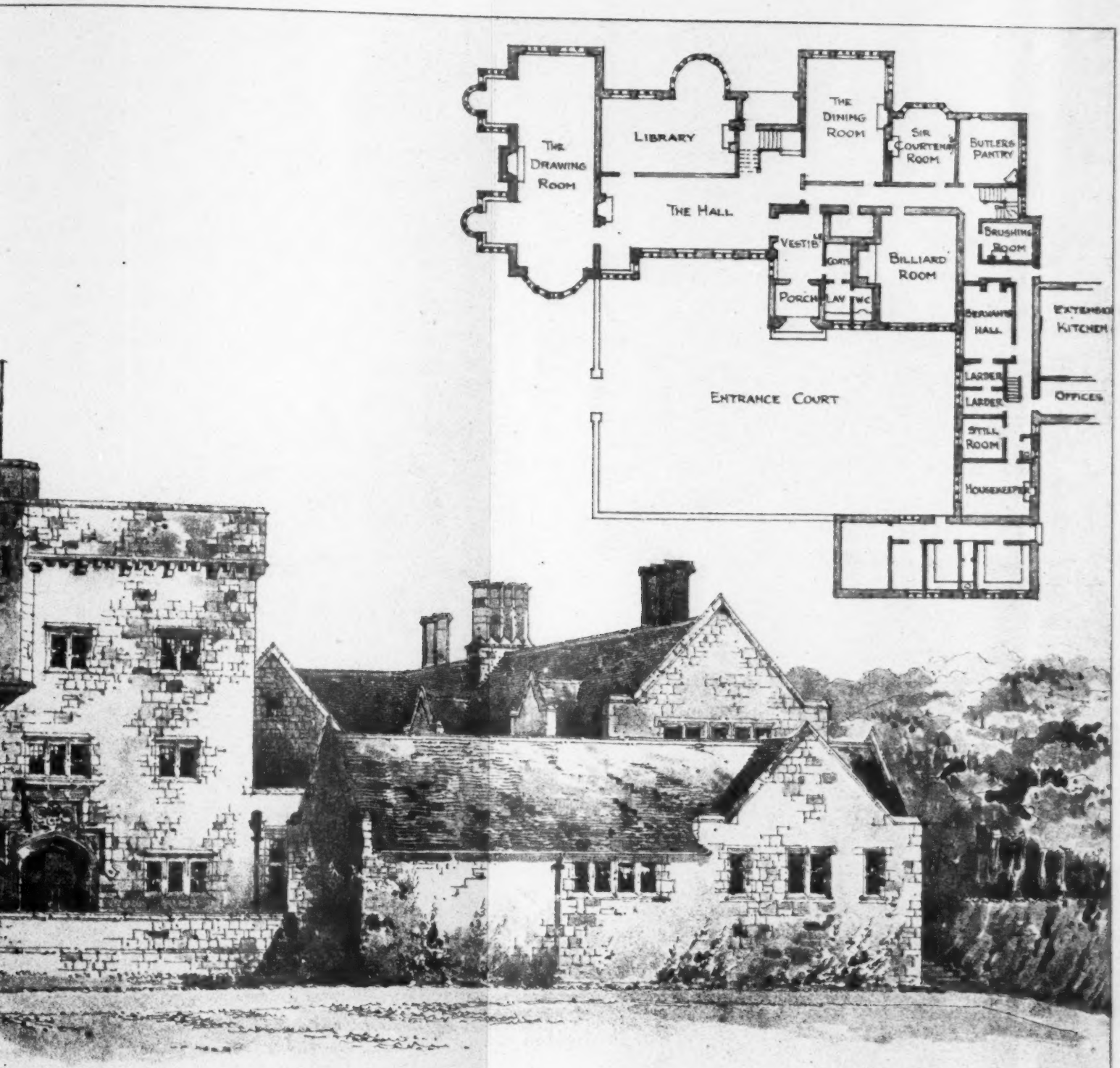
BRIXTON.—Professor Beresford Pite, F.R.I.B.A., Architect.

MAESYCRUGIAU MANOR:
CARMARTHENSHIRE:
for SIR COURTENAY MANSEL: BART:
ARNOLD MITCHELL: ARCHT





THE ENTRANCE FRONT :

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Proposed Hotel.
Churston. Devon.

1/8 Scale.

Sea Front.

G.B. Cawill
Arch.

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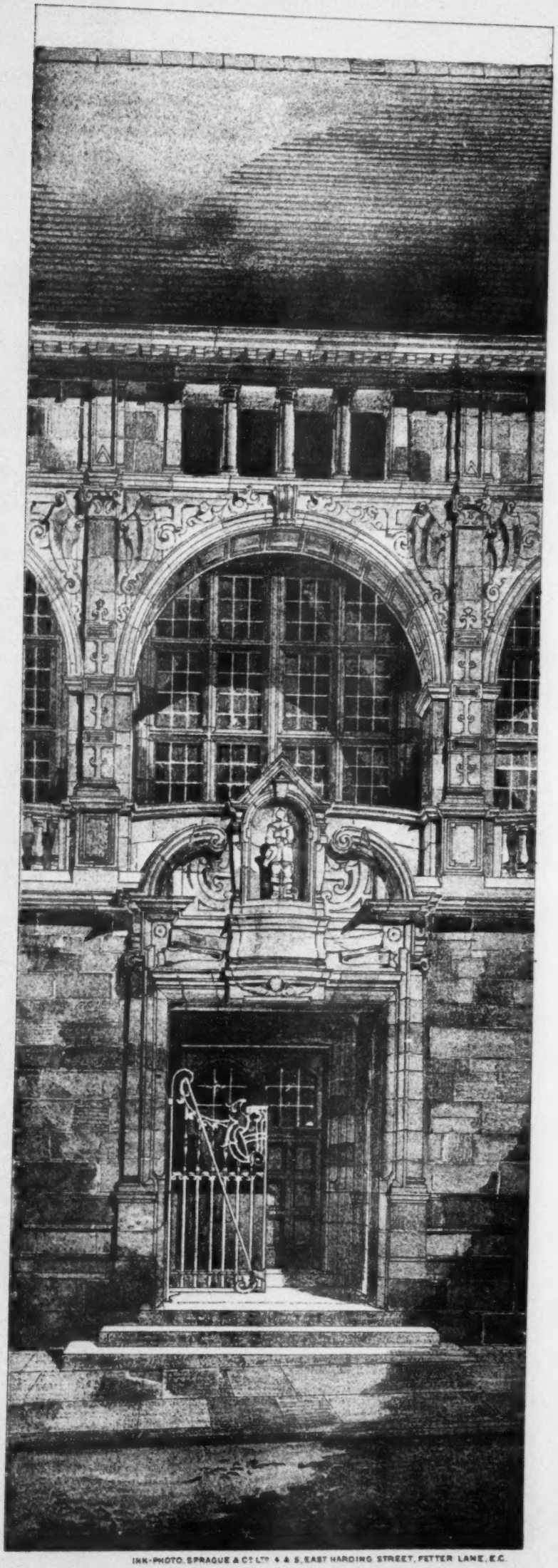

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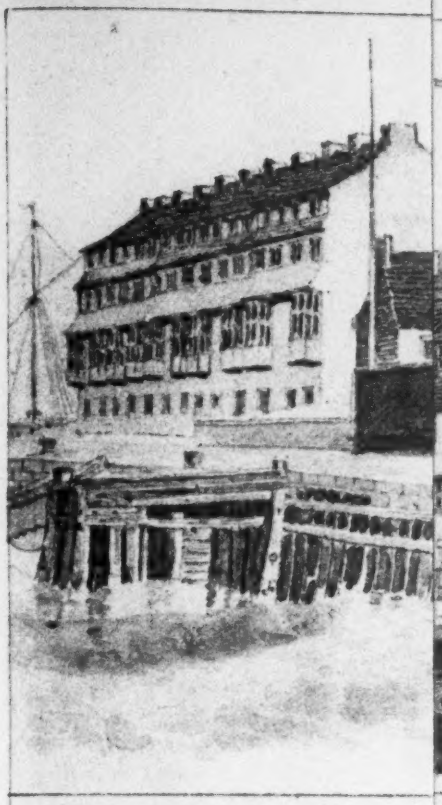
PORTION OF A DESIGN FOR MUNICIPAL BUILDINGS.
By Mr. Thomas Davison, A.R.I.B.A.



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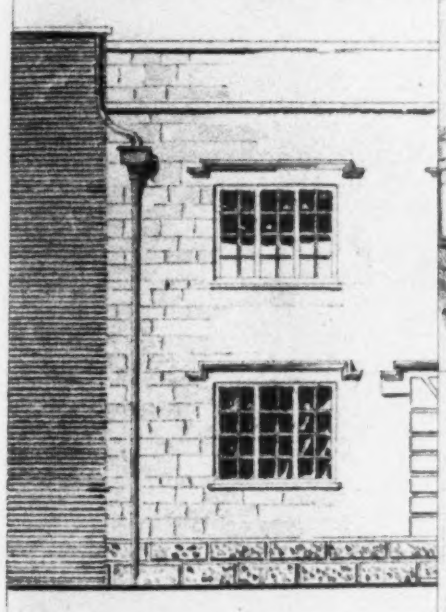
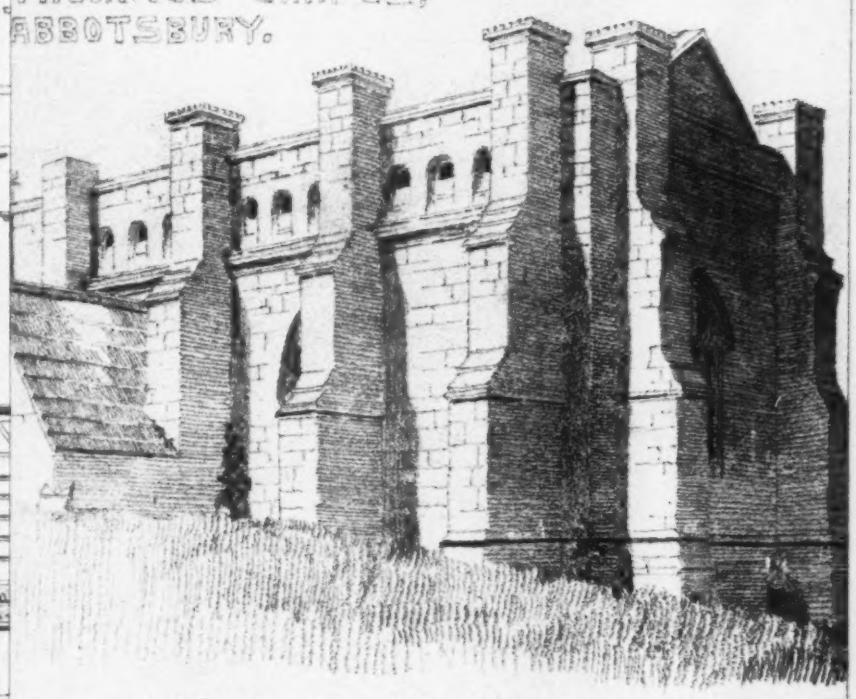


THERINE'S CHAPEL,
ABBOTSBURY.



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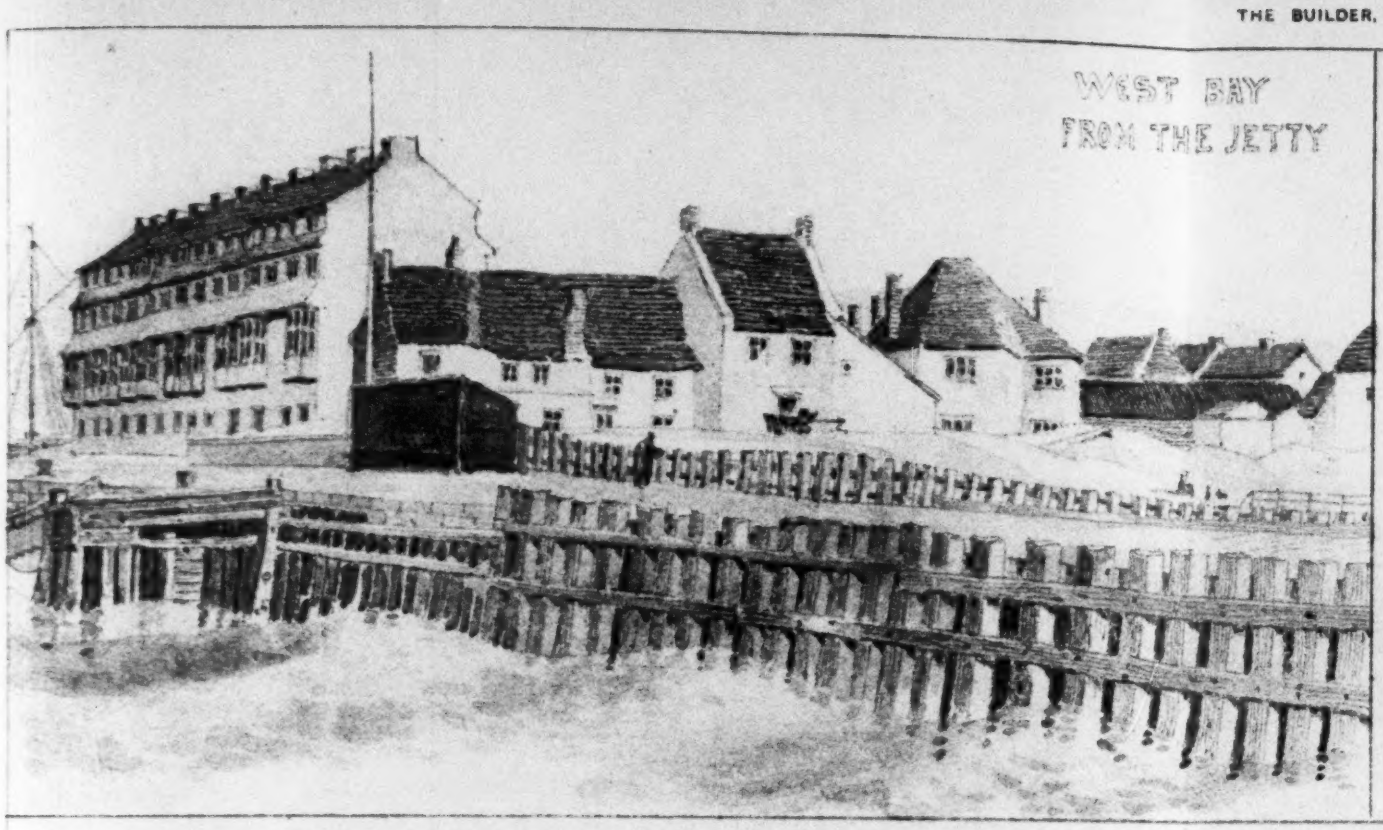
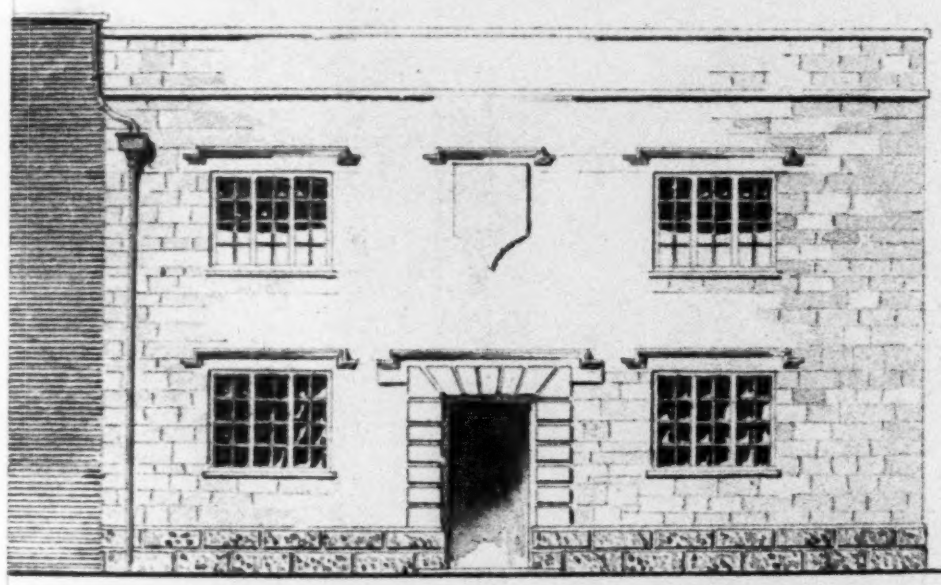
· STATHAM · AUGUST · 1903 ·

INK PHOTO SPRAGUE & Co LTD 4 & 5 EAST HARDING STREET FETTER LANE E.C.



ALMSHOUSES · SOUTH ST. BRIDPORT ·



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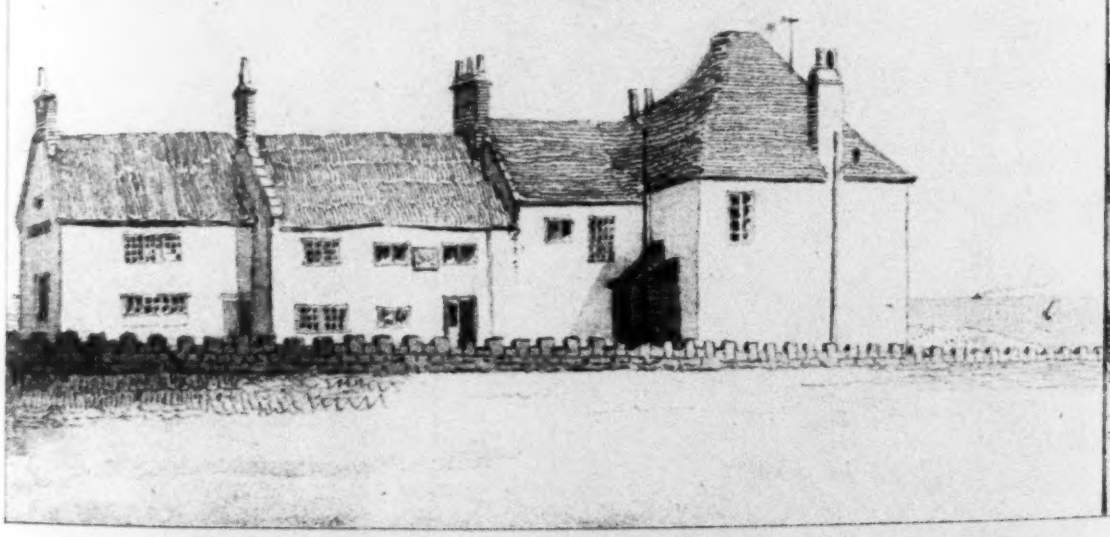

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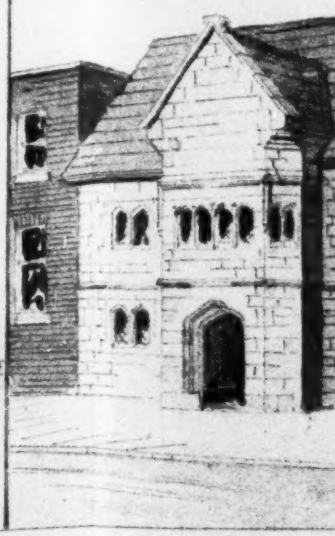

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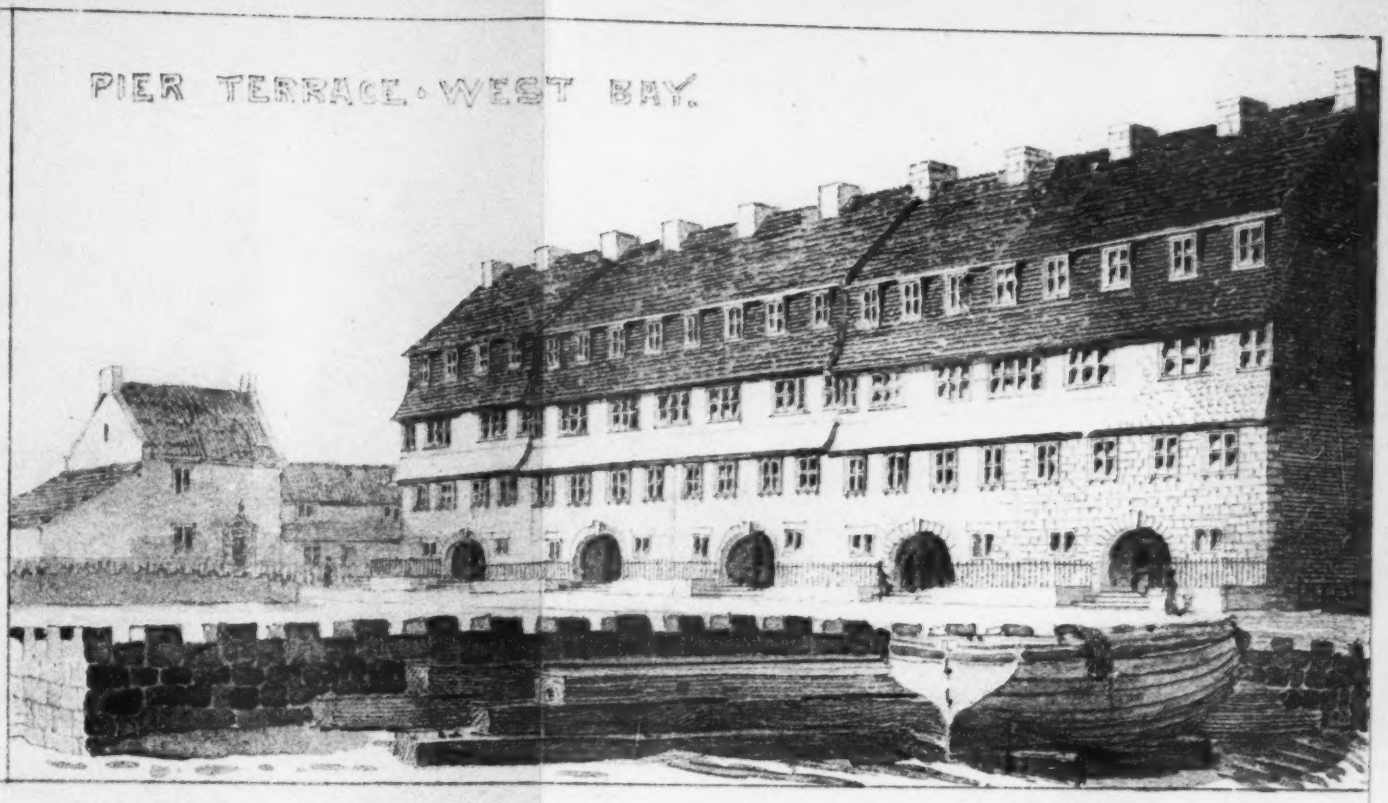

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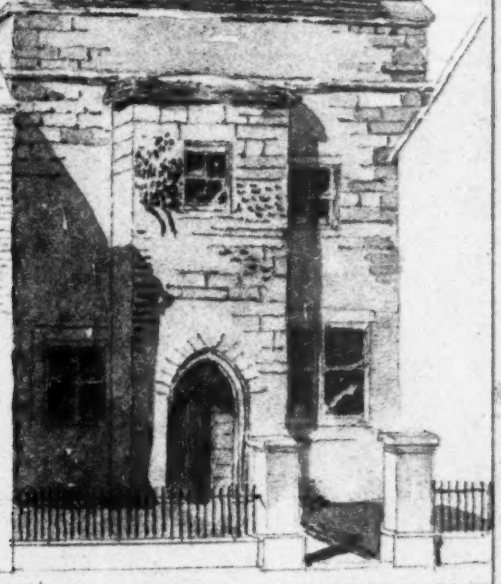

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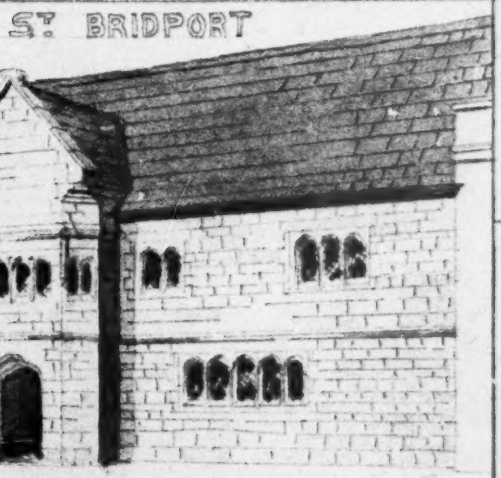
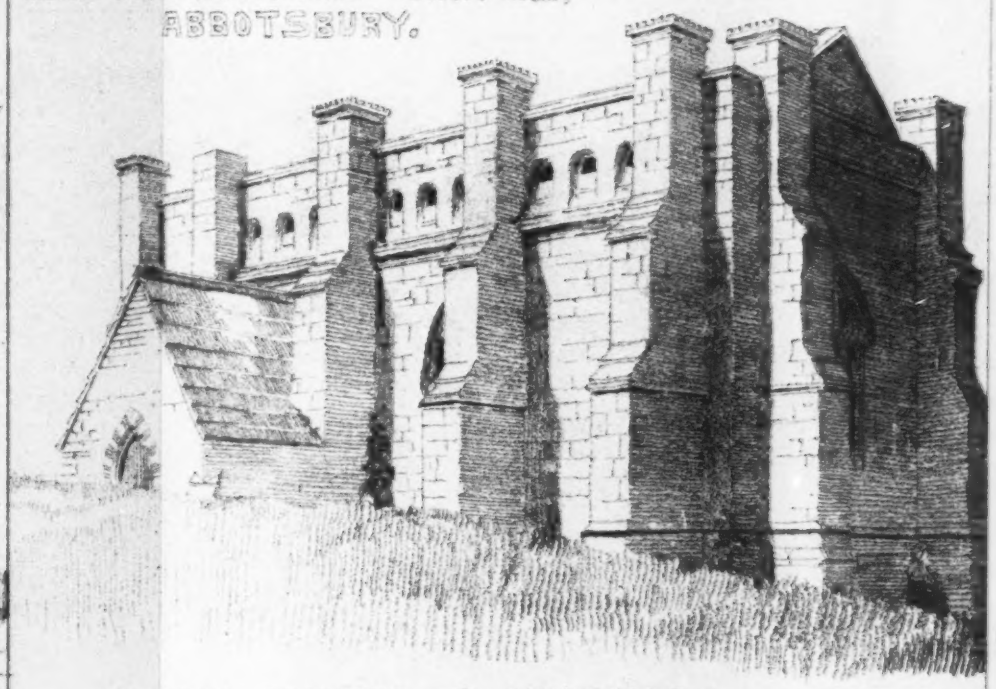


ST CATHERINE'S CHAPEL, ABBOTSBURY.



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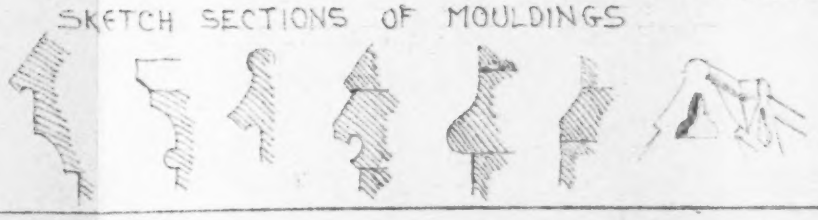

SKETCHES AT A DORSET WATERING PLACE

H. H. STATHAM. AUGUST 1903.

INK PHOTO SPRAGUE & CO LTD 4 & 5 EASTHARDING STREET FETTER LANE, E.C.

We seem almost eager to belittle the industrial efforts of our island. We are unjust to ourselves. Our carpets, our cotton, our cloth, the precision of our machinery, our shipbuilding, our pottery, cutlery, are still unbeaten. Abroad our goods hold their own in quality and finish, although in some directions there is certainly great need for new ideas and improvements of design. When staying at one of the New York largest modern hotels, I was much struck with the beautiful finish of the bath and lavatory appointments and general plumbing work. Being naturally desirous of gathering information wherever possible, I asked for the name and address of the firm who did the work, intending whilst in America to visit their establishment to see their goods. The whole hotel, it turned out, had been fitted up by a London firm. If this had been reversed every newspaper in England would probably have contained an article upon American enterprise, with braggadocio accounts, possibly paid for, about the decadence of the sleepy English sanitary engineer before the young American invader. Gentlemen, in matters of self-advertising we are as Babes in the Wood compared with our cousins. This system of pushfulness at all events, is totally opposed alike to the sentiment of Englishmen and of the better class of Americans.

I have named incentive as the lever for real progress. It has not been very strong with us. The supremacy of our old country for many years in manufactures, industries, wealth, seems to have induced in us the habit of thought that we were by nature and a good providence the only possible first, that our very success indicated there could hardly be room for improvement, that what was good enough for our fathers, and made their fortunes, was good enough for us, who were doing very well, and there was no apparent need for strenuous endeavours for other methods, increased knowledge, new markets; but for those wishing to compete with us, and to effectively attack our position, an opposite state of things obtained. Their necessity, circumstances, and environment have called forth increase of energy and application, whilst we have been in many ways generally content to remain as of old, having formed our habit of believing we were unassailable as the workshop of the world. But this is quickly changing. The working force does not appear to be a matter of race at all. A Britisher going to the States soon adopts the quicker actions of the country, and overcomes the conservatism of his old ways. The best brickwork, for instance, in New York, has been done by English bricklayers.

There is no one definite reason that can be given for this quickening of activity. The work is done under a different organisation, and follows methods of economising human labour. These combined, when acting in conjunction with exactly similar machinery to ours, produce a greater result. And the workman himself recognises this.

Americans have many methods ahead of ours, in others they have as much to learn from us as to teach. There is this great difference, as I have been endeavouring to show—the greater desire to learn, and to take advantage of what they see to effect improvements in their work and methods. They are, in a word, more keen to find out and adopt good new ideas, for the solid, sensible reason that it is to their all-round advantage to do so. And if you find on one side a young man imbued with this spirit in his business, and on the other one who does his work as drudgery, with an eye to leaving it behind at the first moment, which is likely to gain the business, other things being equal? Excessive railway and canal charges may have been in our island largely responsible for decline in some trades, but there have been causes of deeper significance. Have the sons and successors of the founders of our industries generally been actuated by the genius, pluck, and untiring energy as their fathers? The inducement was not there for the same old strenuous life.

We are a very conservative people. A great statesman lately referred to our pedantry and self-conceit of former years with regard to foreign politics. The same faults have been with us in some branches of business. The Prince of Wales, a great thinker, gave his advice to the nation to "wake up" out of this position. We are doing this, and we have made an excellent start towards "speeding up" by owning to ourselves that it is really possible we can be beaten.

There are many events of the past few years that have borne upon us relentlessly that we have not been doing our best, that we have not acted up to our capacity, that we have been too self-satisfied. I need not refer to them in detail, but we know them. Some have come upon us from South Africa with the sharp sudden pain of a blow to our self-conceit—some have hit our self-complacency nearer home. Nothing less would seem to have had real power to move us. We *are* waking up. If we of the building community will but carry forward this resuscitating process and speed up to our work, we shall be acting wisely. We have everything in our favour if we will but overcome our old self-satisfied conservatism of thoughts and methods. The English quiet, self-respecting determination, coupled with greater keenness for quicker work and better organisation, is all we need. It is not entirely the highest speed that is wanted, but the old good workmanship, better speed and progress, well-organised methods.

I was recently asking an Englishman, who had lived twelve years in Melbourne, his opinion of American competition there. He illustrated his answer by saying that if one heard of a good prospecting locality and went to see it, one would be sure to find either a Scotchman or Englishman there already, pegging out claims; but if one went into an ironmonger's store probably half the goods would be American, the remaining portion being English of the same pattern exactly as ten years ago, strong and durable as ever, whilst the American productions of the same class, not as strong and durable as the English make, but improved in style and pattern two or three times in the period. This illustration very clearly explains our respective positions.

I am, with your permission, spending some of your time upon this portion of the subject, for it forms a large part of the principle from which all springs. We are getting more alive to the necessity of speeding up our ways. Allow me to take an instance from some other trade than the building trade: take the boot and shoe trade. It illustrates the principle alluded to. Some years ago this trade was greatly assailed by American manufacturers. They had with skill and ingenuity brought labour-saving machinery to great perfection, and had considered carefully the needs of the trade, the requirements of the people, their customeres. They invaded this country without let or hindrance, causing much trouble to our work-people in that industry. But our shoe manufacturers are dropping their comparatively conservative ways and adopting the latest machinery, and are, as they should do, recovering their position. If they formerly had had the incentive to be improving their methods the American trade would not have come here at all. Now they have to fight it, which they are doing, and are winning. It will be the same probably in every other industry that has been attacked if we will only in earnestness and reality rise to the occasion. From what has fallen within my experience, I have not the slightest pessimism about our trade, our businesses, if we are only true to ourselves and our capabilities. The words "English Manufacture" are a hall-mark the world over for excellence and finish. I have seen in the shops of America such words as "All the goods in this establishment guaranteed of English manufacture," which is another side of the shield to that usually presented to our view.

There is not the remotest claim that American buildings are better built than ours. Work rushed by flares and at night, for instance, cannot be as good as that accomplished by daylight. I am a believer also in the sober section of our working men and women, whose skill has no equal, and I very much doubt if in times of stress and difficulty their quiet, determined courage has, either.

In some sections of industrial activity it will be very difficult to regain our former position, and it will only be accomplished by long, patient study and application. But it is not only this in many cases. I am thinking at the moment of the chemical industries. The German manufacturers are said to have succeeded in obtaining a wider grasp of this business than would have been possible if we had had the inclination and the foresight to have provided thorough training easily within reach. But our Patent Laws are answerable for a great deal of it. Every other nation but ours makes it conditional to work or license a patent if granted in their territory, but we allow a patent to be taken here without this. Although aniline dyes, for instance, were first made in England, the effect is that Germans patent their chemical improved methods in both countries, working it in their own country and stopping anybody doing it here. Surely such a law should be altered if we complain about bad trade. We are deliberately helping the foreigner in many cases against ourselves. There are scores of inventions made by Englishmen thus patented and credited to other peoples by the action of these Patent Laws, and among them many connected with the building trade. This is my excuse for naming them. Even the most fiscally upsetting Conservative or the most commercially reposeful Radical could not object to freeing us from such prejudices as contained in our present Patent Laws.

There are more drones here than in the American hive. This is not very healthy if we are to retain our position. The only way to effect an improvement is to provide inducements. A young American will work and study in his business because he is assured of remunerative employment at the end of it, and the more he knows and the smarter he is the better he will be paid. That inducement does not hold good here to the same extent. If a man is a labourer he will not be allowed to lay bricks, however clever he may be at it, until he has served many years of apprenticeship. What inducement, then, has he to learn to lay bricks? Further, are our new magnificent Technical Schools filled with eager youth striving to extend their knowledge in the particular line of their calling? Many there are who industriously and commendably apply themselves to it, but there is not the eager, hearty entering-in of the great mass of the people because the inducement is not there. Can the desire for knowledge of building construction in the average builder's clerk be compared to his anxiety for a football match?

The second factor mentioned was the position and work of the architect. The great body of architects are greatly interested in their calling, and are keen in their business application, with great capacity for work. They possess, among other reasons, a strong inducement for the due fulfilment of their duties in the fact of the fascination and joy in the work itself. But we have not, as a body, sufficiently risen to the fact that a month saved in the preparation of drawings and data probably means a month's interest and a month's profit to our clients. We have not, also, as a body, sufficiently educated ourselves in modern advance in those forms of construction and the use of materials leading to saving of time, with its attendant advantages. And, if we had, possibly the County Council by-laws would prevent their employment.

It is not fair to a contractor, ready with his plant, his office, his desire to please, to be hampered in his progress by want of drawings, which are his illustrated instructions, his directions. He is a wise architect who will learn that by saving time he is assisting his client and strengthening his own reputation. I am fully aware of the delicate ground I am now crossing. There are many men in my profession as much to the fore in all this as any American, but it is not the average. And in speaking of assisting the speed of execution I am as fully aware as any one that speed is not everything, that in some cases it is a distinct disadvantage in construction and stability, that there are circumstances in which it would be decidedly detrimental to the structure and averse to the interests of one's clients, and in other cases it would be impossible to build quickly; but as a body we do not furnish the contractor as quickly as we should with the drawings if we are expecting him to exercise all he can in forwarding matters. I once knew an architect who obtained estimates for ten different designs for a dining-room dado before he could make up his mind, and I have no doubt many in this room could give some amusing anecdotes of a like character.

Further, we in England—architects and builders—do not as fully fill the ranks of superintendents of the works as we advantageously might. We can most of us learn something here from the Americans. A clerk of works—capable, worthy man though he be, whether formerly a joiner or of any other trade—is considered generally to be performing the whole duty of man by watching material as it arrives to see if equal to the contract requirements, by keeping data as to weather, number of men employed, etc. This, in any work above a small one, needs augmenting. By all means retain the clerk of works for these necessary duties, adding to them the keeping of progress plans, but in any more important work another, and a more highly-trained assistant, or half a dozen such may be added. It is impossible to carry out a large work with

expedition without the aid of plenty of superintendence. If there is much steel employed a qualified engineer is needed at the steelworks to test the materials and to personally see that the proper rolling is done, and that the beams, stanchions, and work generally, as first needed, are being put together well in time for delivery before they are actually needed for placing in position. Capable men are needed on the building itself to supervise sections of the work, and personally see that the rate of progress is maintained, that whatever materials are needed in succession are on the spot. There must be a system of organisation, and each individual supervisor must know his position in it, and undertake that his individual section lacks nothing by want of foresight. These superintendents, under the control of the architect, must look forward in their work, and convince themselves all is ordered well ahead and to be in time. Organisation by a capable, practical head is needed, and the architect is the man appointed to be that head and director. On my own buildings I have progress plans, with the dates upon which certain parts of the work are expected to be completed, it being the duty of the superintendent of any one part to see that such instructions are carried out. He has a defined work to see to. In a building we have now on hand in the North, and covering some 5½ acres of land, this is done, and every part of the work mapped out. It is organisation. It saves time and is methodical. It is what an American would also do. You probably do it also, but it is not universal. In one building we were doing there was a large amount of timber necessary which we bought in America, and we had an inspector in our own pay at New Orleans to inspect the timber before being put on board, in order to ensure proper material and despatch. An American would act similarly.

There is in all new buildings a certain speed of erection which forms the most lucrative rate to the contractor. If on the one hand he gets too slow the cost of erection is enhanced, and the same remark applies if he is excessive in speed. Consequently, if an architect (and the proprietor through him) asks for tenders for the execution of certain works with the intention of placing the contract with the firm submitting the lowest prices, he can, in equity, only expect that rate of speed at which the contractor makes most profit, for that is all he tendered to do and is all the proprietor is paying for. The great majority of contracts are let in this country on this understanding, for the date of completion which is named on the contract is calculated on this footing. Neither an American nor any other contractor tendering on this basis would spend his money on accelerated speed if he reaped no benefit thereby. This part of the matter resolves itself into a small compass. If a proprietor wishes a very quickly-erected building he must pay the necessitated additional outlay enabling the contractor to effect it at a reasonable profit. Herein is the germ of the whole matter, and herein comes the American greater keenness at once. We do not, or have not, fully risen to the fact in the great bulk of our contracts that if a proprietor saves 1,000*l.* in interest on his land value by quickened construction it is a very good business to spend 750*l.* in order to obtain it. It is, of course, no new thing to us, but we have not as fully realised it as we should. An American proprietor not only does appreciate this, but he acts on it, and will spend more than the thousand pounds actually saved in interest, because he makes money by having his works and premises as a going profit-making concern all the sooner. There are many in this country who see all this and act on it, but it is not general. Given the same rate of payment and the same conditions, an English contractor will work as quickly, as well, as thoroughly, and as satisfactorily as an American, and better in some manners and ways which we in this island prefer. I will presently give you an instance of this.

In making a contract, my sons and myself give a penalty for non-completion, with an exactly similar bonus for earlier termination. We find the result just as anticipated, and that we often have to certify for a substantial bonus. It gives us much pleasure when this occurs, for it is an extra payment due for diligent service, good business organisation, and a gain to both proprietors and contractor. If, however, a very speedy work is desired, bonuses are given the sub-contractors for the acceleration.

If some imaginary buildings were worth 100,000*l.* to erect in eighteen months, and the builder were offered 10,000*l.* or 15,000*l.* if completed in fifteen months, there would be a strong inducement to pay extra wages for a choice of good workmen and plenty of them, to find bonuses of 1s. 6d. per 1,000 for bricks for earlier delivery, to provide many a half-crown or five shillings to men to complete a certain thing by a given time, to pay 2,000*l.* for early delivery of steel or stone, to put down the speediest machine, to berth additional superintendents to hustle things up. An American would take greater risks in addition, for they do not put scaffolding like you do in London. Herein, I reiterate, lies the germ of the whole matter, the readiness of the proprietor to pay for the extra speed or advantage.

Having thus dealt with the factors making for the American methods, let us now consider whether in England we have been doing anything very similar. I can only speak of building in the North, where we are accustomed to work harder, longer hours than in the West End, shall we say? And in entering upon this phase of our subject, I can only speak with authority upon those buildings coming under the jurisdiction of my own firm.

[The remainder of Mr. Heathcote's paper, together with our notes of the discussion which followed, will be given next week.]

COMPETITIONS.

Town Hall, Stockport.—The design sent in in this competition by Mr. A. Bramwell Thomas, London, has been placed first by the assessor, but it has not yet been decided that this design will be adopted. It is stated that there are members of the Stockport Council who favour the plans submitted by Messrs. Willoughby and Langham, of Manchester, which have been placed second. The cost of the building will be 70,000*l.*

County School, Acton.—The first premiated design in this competition is by Mr. A. H. Tiltman, 51, Russell-square, W.C.; the second by Mr. Pywell, of Hanwell; and the third by Messrs. Giles, Gough, and Trollope, Charing Cross.

Women's Hospital, Brighton.—Sixty-two sets of drawings were sent in in this competition, and the assessor, Mr. G. T. Hine, of Westminster, has made the following awards:—First, design marked No. 44; second, design marked No. 46; and third, Nos. 11 and 25. The assessor suggested that the Committee should either divide the third premium between Nos. 11 and 25, or, in consideration of their equal merit, award each of them a premium of 20*l.* No. 44 is Mr. John L. Denman, 8, Clifton-terrace, Brighton; No. 46, Mr. E. P. Howard, 39, Cursitor-street, London, E.C.; No. 11, Mr. T. F. Pennington, Tivoli House, Hounslow Heath, W.; No. 25, Messrs. John S. Quilter and F. Anderson, 1 and 2, Adam-street, Adelphi, W.C.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Lewisham.—Nine houses with bay-windows upon the site of "Walmer House," Perry-hill, Catford (Mr. W. Burrell for Mr. Leech).—Consent.

Finsbury, Central.—A four-story building with a one-story addition in front on the site of Nos. 1, 2, and 3, Clerkenwell-green, Finsbury (Mr. S. E. Adams for Mr. W. H. Adams).—Consent.

Lambeth, North.—An addition to St. Thomas's Hospital, Lambeth Palace-road, to abut also upon Westminster Bridge-road, Lambeth (Mr. P. Currey for the Governors of the Hospital).—Consent.

Lewisham.—One-story shops upon part of the forecourts of Nos. 64 and 66, Brockley-rise, Lewisham (Messrs. Norfolk and Prior for Mr. W. Betts).—Consent.

Strand.—A projecting sign in front of No. 124, Long-acre, Strand (Mr. H. E. Pollard for Messrs. Salsbury and Co.).—Consent.

Strand.—A projecting balcony at the Gaiety Restaurant, Strand, upon the first floor level (Messrs. E. Runtz and Ford for the New Gaiety Restaurant and Hotel Company, Ltd.).—Consent.

Finsbury, East.—Buildings on the site of Nos. 152 and 152A, City-road, Finsbury (Messrs. Cluttons for the Ecclesiastical Commissioners).—Consent.

Strand.—That the Council do not accede to the request of Mr. J. H. May on behalf of the Illuminated Advertisements Company for permission to retain twelve projecting illuminated signs in front of No. 48, Cranbourne-street, Westminster.—Agreed

Wandsworth.†—The retention of wood and tile porches to four houses on the west side of Thrale-road, Streatham, southward of Ribblesdale-road (Mr. H. Bignold for Messrs. Crunden and Co.).—Refused.

Chelsea.—An iron and glass portico at the entrance to Grilles Private Hotel, No. 149, Sloane-street, Chelsea (Mr. R. S. Robertson).—Refused.

City.—A three-story oriel window in front of a proposed building on the site of Nos. 90 and 91, Wood-street, City (Mr. G. Vickery for Messrs. W. and H. Smith).—Refused.

Holborn.—An iron and glass shelter at the rear of Nos. 216 to 219, Tottenham Court-road, Holborn, to abut upon Alfred-place (Messrs. Read and McDonald for Messrs. Bartholomew and Fletcher).—Refused.

Kensington, South.—Buildings on a site abutting on the north-western side of Kensington-road and the eastern side of Melbury-road, Kensington (Messrs. Drivers, Jonas, and Co. for the Earl of Ilchester).—Refused.

Norwood.—A one-story shop on the west side of Rosendale-road, West Dulwich, adjoining No. 67 (Mr. W. G. Loe for Mr. L. E. L. T. R. Durant).—Refused.

Width of Way.

Poplar.—That the application of Mr. R. Robertson, for the Housing of the Working Classes Committee, for an extension of the periods within which the erection of buildings and boundary fences on the south side of Leicester-street, west side of Gaselee-street, and south side of Norfolk-street, Preston's-road, Poplar, were required to be commenced and completed be granted.—Agreed.

Hackney, South.—A two-story dwelling-house on the west side of St. Thomas's-place, Well-street, Hackney, with a forecourt fence at less than the prescribed distance from the centre of the roadway of the street (Messrs. Hodson and Whitehead for Messrs. Smith and Howe).—Consent.

Width of Way and Line of Frontage.

Marylebone, West.—A one-story addition in front of No. 11, Gloucester-mews West, Marylebone (Messrs. C. Brown and Sons for Sir J. Walton).—Consent.

Marylebone, East.—An iron and glass shelter at the rear of No. 1, Albany-street, St. Marylebone, to abut upon Albany-mews (Messrs. Brown and Barrow for Messrs. Friswell, Ltd.).—Refused.

Line of Frontage and Construction.

Islington, East.—A portable photographic structure at the flank of No. 1, Electric-parade, Seven Sisters-road, Islington, to abut upon Thane-villas (The Flashtype Company, Ltd.).—Refused.

Space at Rear.

Kensington, South.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building, to be known as Warwick-mansions, on the west side of Cromwell-crescent, Pembroke-road, Kensington (Mr. P. E. Pilditch for Messrs. J. Barker and Co., Ltd.).—Consent.

Kensington, South.—Deviation from the plans approved for the erection of a building on a site on the north side of Oakwood-court, and east side of Addison-road, Kensington, so far as relates to an increase in the height of such building (Messrs. Rolfe and Matthews for Messrs. Jones Brothers).—Consent.

Line of Frontage and Space at Rear.

Wandsworth.—The retention of the buildings Nos. 2 and 42, Oakmead-road, and No. 2, Ravenstone-street, Balham, with irregular open spaces at the rear, and the retention of projecting porches to seventy-nine houses in Oakmead-road and Ravenstone-street (Mr. R. H. Miller).—Consent.

Wandsworth.—That the Council do make no order, on the application of Mr. R. H. Miller, for permission to retain wood and tile gables to houses erected in Oakmead-road and Ravenstone-street.—Agreed.

Width of Way and Space at Rear.

Whitechapel.—A block of shops, with working-class dwellings over, on the west side of Steward-street, Spitalfields (Mr. R. Midworth for Messrs. Pickford and Co., Ltd.).—Refused.

Deviation from Certified Plans.

Finsbury, Central.—Deviation from the plans certified by the District Surveyor, under section 43 of the Act, so far as relates to the proposed erection of a building upon the site of No. 21, Henry-street, Pentonville (Mr. G. W. King for Messrs. Whitbred and Co., Ltd.).—Consent.

Width of Way, Lines of Frontage, and Space at Rear.

Bethnal Green, North-east.—A house, with bay windows and a projecting hood over the entrance in Parmiter-street, and with a stable and van-shed at the rear, on the site of Nos. 7 and 9, Parmiter-street, Cambridge-road, Bethnal Green, to abut also upon Skinner-court (Messrs. H. Dawson and Son for the trustees of the Moravian Trust Estates).—Consent.

Line of Frontage and Working-class Dwellings.

Islington, West.—A block of dwelling-houses on a site on the east side of Caledonian-road, Islington, northward of Pentonville Prison (Mr. R. Robertson for the Housing of the Working Classes Committee of the Council).—Consent.

Islington, West.—Four blocks of intended dwelling-houses, to be inhabited by persons of the working class, and proposed to be erected, not abutting upon a street, on a site on the east side of Caledonian-road, Islington, northward of Pentonville Prison (Mr. R. Robertson for the Housing of the Working Classes Committee of the Council).—Consent.

Formation of Streets.

Wandsworth.—That the resolution of the Council of July 14, sanctioning the formation or laying out of a new street, for foot traffic only, on the site of Nos. 13 to 15, High-street, Putney, to lead from High-street to Brewhouse-lane, and the construction of a roof over such street (Mr. A. E. Chasemore for Mr. T. S. Jay), be modified so far as may be necessary to permit the applicant to erect gates at each end of the street, and to dispense with the erection of posts across such street.—Agreed.

Woolwich.—The abandonment of certain streets, and portions of streets, which were intended to be laid out upon the portion of the Eltham Park estate, acquired by the Council for the purpose of the formation of Eltham Park, the description of such streets being as follows: Greenlaw-road, Crathie-road, Cramond-road, and the portions of Greenlea-road, Glenlyon-road, and Glenshiel-road, east of Glenesk-road, the formation of which was sanctioned by the Council on October 10, 1899, upon the application of Mr. G. F. Logsdail on behalf of Mr. A. Cameron Corbett, M.P.—Agreed.

Wandsworth.—That an order be issued to Mr. A. J. Wellings sanctioning the formation or laying out of new streets for carriage traffic to lead out of the north-western side of Franciscan-road and North-eastern side of Totterdown, Tooting.—Agreed.

Lewisham.—That an order be issued to Messrs. Eastman Brothers sanctioning the formation or laying out new streets for carriage traffic, to lead out of the south side of Sydenham-road, Lewisham (for the Building Estates and Property Association, Ltd.).—Agreed.

Dulwich.—That an order be issued to Mr. C. E. Barry, sanctioning the formation or laying out of new street for carriage traffic to lead from Woodwarde-road to Court-lane, Dulwich, and in connexion therewith the widening of a portion of Court-lane.—Agreed.

Lewisham.—That an order be issued to Mr. A. W. Osborn sanctioning the formation or laying out of new streets for carriage traffic to lead out of the south side of Leahurst-road, Lewisham, to Fernbrook-road (for Messrs. Johnson and Aldridge).—Agreed.

Lewisham.—That an order be issued to Mr. E. J. W. Hider refusing to sanction the formation or laying out of a street (a mews), 14 ft. wide, to lead out of the north side of Dowanhill-road, Torridon-road, Lewisham (for Mr. Richards).—Refused.

Means of Escape at Top of High Buildings.

Holborn.—Means of escape in case of fire proposed to be provided in pursuance of section 63 of the Act, from the front rooms on the sixth floor of the "Bedford Hotel," Nos. 83, 85, and 87, Southampton-row, Holborn (the upper surfaces of the floors of which rooms are above 60 ft. from the street level) for the persons dwelling or employed therein (Mr. H. Walduck).—Consent.

Lines of Frontage.

Woolwich.—Buildings on the site of the "Duke of York" beer-house and "Fortune of War" public-house, and of Nos. 16 to 38 (even numbers), inclusive, and Nos. 35 to 63 (odd numbers), inclusive, and on a portion of the site of the "Coffee Tavern," New-road, Woolwich (Messrs. Church, Quick, and Whincop for the freeholders of the Burrage estate).—Consent.

The recommendation marked † is contrary to the views of the local authority.

METROPOLITAN ASYLUMS BOARD.

THE usual fortnightly meeting of the managers was held on Saturday last week, at the offices, on Victoria Embankment, Sir R. Hensley in the chair.

On the recommendation of the Finance Committee it was agreed to make application to the Local Government Board for an order authorising an expenditure of 135,200*l.* on the proposed reconstruction of the South-Eastern Hospital.

The General Purposes Committee reported on the proposed establishment of sanatoria for consumptives. The matter was considered by the Managers a year ago, when the Bermondsey Borough Council addressed the Board on the subject. The matter was then deferred for a year.

The Committee now recommended: —

"That the Managers, having duly considered the question of the proposed establishment of sanatoria for consumptive patients and the letters received from the Local Government Board and the various metropolitan Local Authorities and Medical Officers of Health in regard thereto, are of opinion that the matter is one of such vital and far-reaching importance to the community at large, and one which, if adopted by the Managers, would entail so considerable an extension of their duties and responsibilities, and so large an increase in their expenditure, as to call for some authoritative expression of opinion by the chief Health Authority of the country, viz., the Local Government Board, before the Managers are asked to take any definite action in the matter, or to make any further inquiries in regard thereto; and that the Local Government Board, the several Boards of Guardians, the Borough Councils, and the Medical Officers of Health be so informed."

This was agreed to after some discussion.

The Contract Committee submitted a report dealing with the practice of taking the names and addresses of persons applying for tender forms. The Committee had been instructed to report as to the advisability of discontinuing the practice. The practice was instituted by a resolution of the Committee of the 28th February, 1900, and the method adopted was as follows:—A slip is handed to each applicant for a tender form and he is required to enter thereon the name and address of his firm, the form of tender required, and the date. These slips are filed, and when the time for issuing forms has expired, all the slips are packed up, labelled, and stored. The Committee were of opinion that the system gave a useful means of reference in case of any question arising as to the firms who had tender forms. It also prevented firms from obtaining an unnecessarily large number of copies of each tender form. It appeared to the Committee, however, that it would be advisable to limit their issue as far as practicable to persons likely to submit bonâ fide tenders. So far as they could see, no legitimate objections to the practice exist, and so far as was officially known, no complaints against the system had been made by any of the numerous firms who ordinarily applied for tender forms.

The report was received.

On the recommendation of the Works Committee Messrs. W. H. Barber and Son were appointed to take out the quantities of the reconstruction works at the South-Eastern Hospital.

COURT OF COMMON COUNCIL.

THE usual Court of Common Council was held in the Guildhall on Thursday last week.

On the motion of Mr. Samuel Alderton, the Streets Committee were directed to consider the existing regulations in regard to lamps overhanging the public ways, and to report as to the desirability of making any alterations therein.

Mr. Morton, the Chairman of the Streets Committee, said that the Committee already had the matter before them.

The Sanitary Committee submitted a report in which they referred to a letter from the London County Council, which had been referred to them for report, enclosing copies of a first draft of certain sanitary provisions which the Council proposes to seek in its General Powers Bill of next Session, which letter asked the views of the Corporation on the question of such provisions being made applicable within the City of London. The Committee recommended that the suggested provisions be approved generally, subject to the Corporation being the sole authority for carrying out the Act within the City, and to its being exempted from the operation of the clause giving the Council power to institute proceedings in the City. The recommendation was agreed to, and it was agreed also to inform the London County Council accordingly. The Committee reported also on a letter recently received from the London County Council enclosing copies of by-laws with reference to the casting of waste-paper, etc., in public thoroughfares, spitting in public places, window-cleaning and painting, etc., which by-laws are now in force in the Administrative County of London. The recommendation of the Committee that no action be taken in the matter at present, was agreed to.

Among the correspondence received was a letter from the London County Council enclosing two copies of a return of the condition of bridges carrying railways over roads and roads over railways in the County of London, and stating that the Council had been advised that any steps taken under Sections 46 to 67 of the Railway Clauses Consolidation Act, 1845, which deal with the question of repair and maintenance of bridges, etc., must be at the instance of the local authorities. A letter was received from the Town Clerk of the Metropolitan Borough of Paddington with reference to the recent litigation on the question of the right of the Borough Council to erect a hoarding in front of a block of flats overlooking an open space (St. Mary's Disused Burial Ground) to prevent the owner of the block in question obtaining a right to the access of light. The letter enclosed a copy of a resolution passed at a recent meeting of the Borough Council:—

"That the attention of the Corporation of the City of London, London County Council, the City of Westminster, and the Metropolitan Borough Councils be called to the case of Boyce *v.* Paddington Borough Council, and that they be asked to express their willingness, or otherwise, to share in the expense of carrying the appeal to the House of Lords."

ROYAL COMMISSION ON LONDON LOCOMOTION.

ON Thursday last week, the Royal Commission sitting under the chairmanship of Sir D. Barbour heard evidence from Mr. J. H. Brown, Chairman of the Highways Committee of the Battersea Borough Council, who also spoke generally for many of the other Borough Councils of London. Witness advocated the establishment of a steamboat service, and the extension of the cab radius. He pointed out the nuisance which arose from the unloading of scaffolding, etc., and thought that with regard generally to the regulation of unloading in streets, the Police and the Borough and County authorities should co-operate together to fix times of prohibition in each district, to meet local needs and circumstances. He referred at length to the constant breaking up of streets by companies having the power to do so, and said that in two years in Battersea alone there had been 8,734 such openings. It was true that the companies were supposed to leave the street in a proper condition, but where a street was paved with wood it was certain to be damaged by being broken up. While, however, the Borough Councils desired greater powers of control as to the breaking up of the streets, they strongly objected to the County Council usurping their functions as street authority. His Council was in favour of the Police controlling omnibus routes, and if this were done, the local authorities would make up roads specially with granite to suit their traffic. With respect to unenclosed forecourts, it was frequently found that the paving of them was unsightly, and they were often dangerous through being badly paved. He thought the local authority should have power to compel owners of forecourts either to suitably enclose them, or to pave them at such a level and with such material as they might direct. The queues outside theatres and music-halls constituted a nuisance, and his Council thought, in erecting new buildings of this class, powers should exist to compel provision to be made upon the premises for those waiting to enter.—Mr. H. G. Hills, Town Clerk of Wandsworth, said his Council would object to the London County Council having control over the opening and reinstatement of trenches in streets. He suggested that Section 72 of the Metropolis Management Amendment Act of 1862, which required the previous consent of the London County Council to a street widening by a Metropolitan Borough Council, should be repealed. He would object to the suggested abolition of the veto of the local authorities as to tramway schemes, and gave as a reason the case of the County Council wishing to make the local authority pay one-third of the cost of widening a street which it was necessary to widen simply for the construction of a tramway which did not particularly affect Wandsworth.

The first witness called at the sitting of the Commission on Friday last week was Mr. Alderman J. H. Robinson, the Chairman of the Works Committee of the Stepney Borough Council. He gave evidence at some length with regard to street improvements in that Borough, and put in a number of recommendations by his Council. The Council were of opinion that it should be compulsory upon the owners of docks, when so required by the highways authority, to substitute for the existing inadequate swing bridges, bridges of sufficient capacity to meet the requirements of the traffic, such bridges to be fitted with the latest mechanical appliances. That the bridge when so reconstructed should be subject to the jurisdiction of the Borough Council as the highway authority, who should

be empowered to make by-laws for regulating the manner of opening the bridges, etc.

Mr. James Rush Dixon, Surveyor to the Metropolitan Borough Council of Shoreditch, was then called, and gave evidence at some length. He said that the length of public streets in Shoreditch was forty-three miles, of which some five miles were busy thoroughfares for traffic across London. There were many streets in the Borough where the congestion was most marked, it being particularly bad between the hours of seven and nine in the morning, at midday, and again in the evening from five to eight o'clock. Such streets were Old-street, Kingsland-road, Norton Folgate, Holywell-lane, Hoxton-street, and East-road. Considerable blockages occurred at the junction of the streets. In Old-street, Kingsland-road (southern end) and East-road, the congestion was due to a large extent to the trams, there being considerable lengths of single line. It was the opinion of his Borough Council that the congestion would in a great many cases be relieved by the construction of passenger subways. He mentioned as places where such subways would be convenient the intersection of Old-street and Kingsland-road, Shoreditch High-street, and Great Eastern-street and Commercial-street.

THE LONDON BUILDING ACT.

On Wednesday the Law and General Purposes Committee of Bethnal-green Borough Council reported having asked the London County Council to consider the following points when preparing their bill to amend the London Building Act:—

To prevent building on forecourts except under such conditions as will prevent danger to life in case of fire.

To prevent buildings being erected rendering existing buildings on another owner's land unsuitable for habitation by reason of obstructing access of light and air.

To secure power to set back buildings about to be erected on the site of old buildings less than 20 ft. from the centre of the road, if the cubic contents or height of the new structure will be greater than the old.

That factories and warehouses shall not be erected upon unbuilt-on spaces substantially surrounded by dwelling-houses, on which spaces the building of dwelling-houses would be prohibited for want of air space.

That power should be conferred on Borough Councils to control raking shores.

That the Borough Council shall have power with regard to permitting or not the erection of bridges and similar projections across streets.

That power be given to the Borough Councils to control awnings, blinds, and similar projections from shop fronts without need to prove the existence is an annoyance.

TRADE CATALOGUES.

The Beeston Foundry Co. (Beeston, Notts.), send us their catalogue of radiators, boilers, pipes, and fittings for heating apparatus. It is a volume of 100 pages, clearly printed, well bound, and fully illustrated, and shows what English manufacturers can do when roused by American competition. The principal radiators are of the vertical type, with one, two, or three columns from back to front, and are made in sections so that radiators of various lengths can be put together without difficulty. Other varieties are square, circular, annular (to clasp columns), and quadrant (to fit in angles). Loop radiators for ventilation are also shown, and a hinged radiator for hospitals, which is arranged to swing like a gate, so that every part can be easily cleaned. In every case complete dimensions are given, including the area of heating surface. Among the boilers we notice the "Robin Hood" and "Mona," which are of cast-iron, made in sections so that boilers of various sizes can be built up from similar parts. The "Beeston" boiler is either cast or wrought welded. The fittings illustrated include a great variety of pipe-connexions, expansion boxes, cisterns, valves, grates, pipe-stands, etc., complete prices are given, and there are also some valuable hints on heating apparatus generally, and on the company's apparatus in particular. The catalogue is one to keep and use.

From Mr. L. Rasch we have received a twenty-eight page catalogue of the patent "Economy" gas cooking stoves and independent coal ranges. The gas cooking stoves are made of wrought-iron, double-jacketed and insulated, with malleable cast-iron top plates, on which the cooking utensils are placed; the heating is therefore indirect, as the burners are below the hot plate. It is claimed that this arrangement economises gas, and reduces the labour of cleaning. The catalogue contains illustrations of roasting ovens, grillers, hot closets, cookers, coffee apparatus, portable stock-pots, etc., heated by gas, independent coal ranges, combined coal and gas ranges, coke or charcoal grills, etc. An illustration of the works at which these fittings are made is given, but the town and county are not stated.

A well-bound catalogue of 644 pages has been received from Messrs. T. and W. Farmiloe. It is a comprehensive catalogue of the tools, materials, and fittings used by plumbers, glaziers, painters, and others. Nearly seventy pages are devoted to water-closets of various kinds, earth-closets, seats, cisterns, etc. Lead bends and traps, both cast and hydraulic drawn, are illustrated and described. These are followed by a section on drainage running to forty pages, and including manhole covers, grates, flushing tanks, cast-iron and stoneware drain-pipes, traps, channels, testing and cleansing apparatus, etc. Twenty-six pages are given to inlet and outlet ventilators, and to chimney cowls. Lavatory basins and fittings occupy eighty pages; urinals, sixteen pages; baths and geysers, fifty pages; pumps, garden fittings, and hose, fifty-three pages; plumbers' fittings (taps, unions, washers and wastes, traps, etc.), forty-five pages; and gas fittings, fifteen pages. These are followed by speaking tubes, lightning conductors, electric bell fittings, telephones, filters, water-softening apparatus, heating apparatus, cisterns, hot-water tanks and cylinders, wrought-iron tubes and fittings, rain-water goods, soil-pipes, plumbers' and gasfitters' tools and materials. Varnishes, paints, and painters' tools occupy forty pages, and glass and glaziers' tools fifty pages. There is a good index of twenty-eight pages. It will be seen that the catalogue is a useful work of reference for builders.

"The September, 1903, Illustrated Catalogue" of the General Iron Foundry Co. contains upwards of 600 pages, about one-half being devoted to kitchen ranges and stoves of various kinds, steam cookers, hot closets, fire-grates, mantels, etc. Many of the interiors and mantel registers are, as is so frequently the case, overloaded with ornament. Ten pages are devoted to cast-iron baths; these are followed by lavatories, and a few sinks and water-closets are shown. The more strictly utilitarian work includes manhole-covers, grates, pumps, cattle and pig troughs, street urinals, air grates and other ventilators, soil-pipes, rain-water goods, cast-iron sashes and sky-lights, columns and lamp-posts, cast-iron staircases, verandahs, railings, and gates are also shown, as well as wrought-iron fencing and gates. Two special sections are devoted to stable and cow-house fittings and hot-water apparatus; the latter including boilers of different kinds, radiators, pipes, and fittings. From the same firm we have also received an illustrated catalogue of wrought-iron casements, and another dealing with wrought-steel and cast-iron windows, and cast-iron fire-escape stairs.

Messrs. Smith and Turner send us their "Abridged Catalogue of Inventions mostly for the efficient working of doors, gates, sashes, fanlights, and the like, produced from a century's accumulated experience and experiment." It contains illustrations and prices of door-springs of various kinds, door-stops and buffers, water-bars for the sills of casements, espagnolette bolts, panic bolts, fanlight-openers, self-closing gate-hinges, etc., many of the fittings being of an ingenious character.

The St. Pancras Ironwork Co. have sent us their catalogue of iron staircases, doors, verandahs, balconies, etc. It contains 106 pages. Different designs of spiral cast-iron stairs are first shown, and these are followed by straight flights, plain and ornamented. Numerous illustrations of fire-escape stairs and balconies, erected by the company at hospitals, hotels, flats, factories, and other buildings, are given as examples of this kind of work. Attention may be drawn to the different kinds of treads used by this company in their iron stairs. Among the other illustrations we notice wrought-iron and cast-iron gates, pavement and stall-board lights, cast-iron verandahs and porches, iron roofs, and stable and cow-house fittings. The catalogue contains some useful memoranda on iron and steel.

We have received from Messrs. Hayward, Brothers, and Eckstein their "Section 10" catalogue of metal casements and sashes, collapsible gates, iron doors, etc. The casements include inward-opening, outward-opening, horizontal and vertical swivel, "fall-back" or hopper, and folding, and separate illustrations of casement fittings are given. Steel and cast-iron sashes are shown in considerable variety; the dimensions and prices of stock sizes cannot fail to be of use to architects and builders. Attention may be drawn to the prismatic sheet glass for refracting light into dark rooms. The section on collapsible gates occupies twenty-four pages, and contains illustrations and prices of gates of various kinds. The catalogue contains also a few examples of wrought-iron grilles, iron doors, etc.

Messrs. Mellowes and Co., London, have sent us a small catalogue containing illustrations and descriptions of their "Eclipse" roof-glazing. Nearly the whole of the catalogue is devoted to photographic illustrations of important buildings in which this system of roof-glazing has been adopted, including the Crystal Palace and some large railway stations. A folding sheet is inserted in the catalogue, and will be useful to architects and builders, as it gives details (one-fourth full size) of all the woodwork, lead flashing, etc., required in connexion with the glazing.

An illustrated catalogue and price list of joinery has reached us from Messrs. Henry Sandell and Sons. It contains illustrations and prices of gates, doors, handrails, newels, balusters, trellis-work, mouldings of various kinds and for various purposes, sash stuff, etc., and will be of use to builders and (although to a less degree) to architects.

We have received from Messrs. Rd. Melhuish, Sons, and Co., a copy of the new edition of the "Ironmongery" section of their catalogue. It is a well-bound volume of 336 pages, and is a worthy companion to their "Tool" catalogue, which we noticed some time ago. At a rough estimate, the number of illustrations exceeds 2,000, and it is therefore impossible for us to do more than indicate, in a general way, some of the more important classes into which these may be assorted. The first place is given to door-furniture, among which are latches, locks, knockers, letter-boxes, handles, hinges, finger-plates, draught-excluders, etc. Gate fittings are also shown. The window furniture includes sash-fasteners, casement-fittings, fanlight-openers, sash-lines, pulleys, lifts, fittings for blinds, curtain-rods, etc. Other important classes are galvanised-iron goods, stable-fittings, ventilators, gas-cookers and stoves, plumbers' brasswork, gas-fittings, electric bells, and electric light fittings. In addition to these there is a miscellaneous assortment of the minor goods included under the term of ironmongery, such as hooks of various kinds, nails, screws, bolts, drawer-pulls, and cupboard fittings. The illustrations also include baths, heating apparatus, rain-water goods, etc. There is a full index, and the catalogue is a convenient work of reference for architects and builders in search of ironmongery of stock patterns.

The Student's Column.

CONCRETE-STEEL.—XXIII.

COLUMNS.

In view of the fact that increasing importance attaches to the reliability and endurance of columns and stanchions in modern building construction, such members deserve the most careful consideration. It is not enough for the architect to know that the strength of the columns is adequate to support the calculated loads; he must also be satisfied as to their durability and fire-resisting qualities.

The possibility of corrosion in steel columns erected in the ordinary way, protected by nothing better than one, two, or three coats of paint, and simply enclosed in the walls of a building, ought to cause more uneasiness than appears to be experienced by most designers who follow this undesirable practice. Even if the metal were thoroughly cleaned before painting—which is seldom the case—no one can reasonably expect the original coating of paint to be sufficiently durable to insure the safety of a structure for all time. It is universally admitted that steelwork exposed to climatic influences must be repainted at regular intervals for the purpose of preventing corrosion, but steel columns encased in brickwork cannot be treated in the same way, and those responsible do not always reflect that the inherent porosity of brick, and fissures or other internal spaces may permit moisture to gain access to the protecting paint. Considering these points, together with the admitted fact that

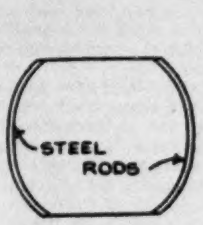

Fig. 47.

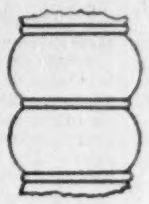

Fig. 48.

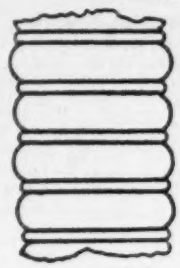

Fig. 49.

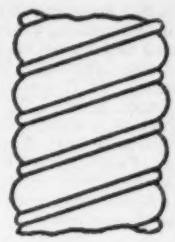

Fig. 50.

corrosion may take place underneath the paint itself, it becomes evident that columns applied in the manner indicated, cannot be considered as really durable members of a structure. They may be moderately well protected against fire, but interior columns that are not encased in brickwork are certainly not.

The excellent practice of enclosing isolated columns in terra-cotta or other casings affords considerable protection from fire, but not necessarily from corrosion, and the next step in advance is to cover all isolated columns with concrete, at the same time filling any interior cavities that may exist with the same material. Similar treatment is also advisable in the case of columns built into the walls.

Practical experience, and notably the recent examinations of steelwork taken from some buildings demolished for the construction of the New York Rapid Transit Subway,* has sufficiently proved the preservative effect of concrete so far as corrosion is concerned, while the service rendered by concrete as a fire-resisting material is too well-known to require comment.

We are brought in this way to the conclusion that the joint use of steel and concrete is most desirable in column construction, as conducing to durability and fire-resisting qualities. The next point to consider is whether the materials can be employed to better advantage than they are when the central core consists of steel and the outer shell is composed of concrete. This question is soon answered, for the laws governing the design of columns tells us that metal is of far less value in the centre than at the outside of such members. As a hollow cylinder undoubtedly possesses the best and most economical section, the proper place for the steel would be outside the concrete if nothing but strength had to be considered. But we have also to insure safety from corrosion and fire, and this may be done by adding an outer casing of concrete.

Thus we arrive at a form of column in which there are three concentric parts, (1) a central core of concrete, (2) a middle zone of steel, and (3) an outer zone of concrete. The steel is applied so that its maximum strength may be developed, and the concrete protects the inner and outer surfaces of the metal, and contributes to the resistance of the column.

In numberless cases the hollow interiors of cast-iron and steel columns have been filled with concrete, sometimes with and at others without an exterior covering, and it is quite a common practice to employ foundations for bridges and other structures, where concrete is filled into steel cylinders. But we believe that architects and engineers rarely calculate upon the additional strength so gained, and it is not generally known that the additional resistance actually is very great, or that the concrete used in this way acquires new qualities of truly surprising character.

Engineering text-books have nothing to say upon these points, which belong to the new and comparatively unknown domain of concrete-steel.

For the moment we will put aside the question whether a cylindrical tube constitutes the most desirable form in which steel may be applied in conjunction with concrete for the construction of columns, as, before proceeding to discuss matters of this nature we propose to refer to the characteristics of concrete in compression, when reinforced by steel in tubular form.

The internal forces acting in solid bodies may be placed in two categories. Cohesion is the force by which the molecules are held together, this force varying in proportion to the distance of the molecules from each other up to the elastic limit. Friction is the resistance to the relative motion of bodies, and it exerts an action in the interior of bodies similar to that exerted on their surface. Concrete is a body in which cohesion and friction are both evidenced, and these forces unite to resist compression. Sand may be taken as a fair example of a cohesionless body, in which resistance to compression is afforded by friction alone. When sand is filled into a tube and subjected to pressure by a piston small enough to fit inside the tube, friction between the particles resists compression to a certain degree, but as the height of the sand column is decreased there is a tendency to bulge outwards, causing pressure on the interior of the tube. As this pressure is resisted by the surrounding metal, the longitudinal shortening of the column is prevented to a very considerable extent, and the sand is effectively reinforced. This principle is exemplified in the sand pile, which consists of a sand column formed in earth by the aid of a hollow steel shaft sunk to the required depth and withdrawn as the sand is filled in. The lateral bulging of the sand has the effect of reinforcing the surrounding earth, so that the condition is the converse of that obtained in the case of a column.

When concrete is placed in a tube and subjected to axial pressure, the resistance to longitudinal shortening is increased by molecular cohesion, and proportionately less pressure is exerted laterally on the metal. Consequently, the thickness of the latter can be much less than that required for the support of a sand column. Assuming the coefficients of friction to be of equal value, the difference between the resistance of the sand and the concrete indicates the effect due to cohesion, and the difference in question may be termed the specific resistance of concrete.

The efficiency of a tube for reinforcing sand or concrete in the manner suggested, depends largely upon the fact that the lateral bulging at any cross section is small as compared with the total longitudinal shortening. Consequently the intensity of tensile stress in the metal is far less than the intensity of the stresses that would result from direct axial pressure equal in amount to the pressure applied at the top to the sand or concrete. The steel is applied in a form that permits its tensile strength to be utilised in the most advantageous manner, and the concrete, prevented from extending laterally, is most materially assisted in withstanding axial pressure, a duty for which it is well fitted by its comparatively great compressive strength.

The foregoing argument leads naturally to the conclusion that exceptionally favourable results may be realised by confining, or, in other words, in reinforcing the concrete so as to minimise lateral bulging.

So far as we are aware, the only investigation bearing upon this treatment of concrete is one conducted by M. Considére, and reported by him in two communications made last year to *L'Académie des Sciences*. As the scope of the *Comte Rendus* did not permit a fully detailed account of the entire investigation to be given, the information therein contained has been supplemented by articles published simultaneously in two technical journals.*

One remarkable experiment made by M. Considére was the following:—A metal tube, 7½ in. diameter, was filled with concrete, and then bent, so that the radius of curvature of the central line was 21.6 in. After this, the tube was cut and removed. Notwithstanding the considerable deformation undergone by the concrete, it was not broken, only a few cracks were found on the compressed side, and subsequent tests showed that the concrete still possessed very considerable strength.

This test does not throw light upon the compressive resistance of concrete reinforced by a surrounding case of metal, but it is sufficient to reveal the very unexpected fact that a material usually regarded as extremely brittle, can be made to acquire considerable ductility. In consequence of the result obtained from the test, it was decided to try a similar experiment upon concrete reinforced with a spiral winding of iron wire, a type of reinforcement termed "hooping" by M. Considére.

Accordingly, a specimen was prepared, consisting of a concrete prism, 4 ft. 3 in. long, reinforced with longitudinal rods and spiral hooping, the concrete being mixed in the proportion of 840 lb. of Portland cement to 1 cubic yard of gravel and sand. The prism was subjected to a pressure of 7,940 lb. per square inch of original section, and was bent into the shape of a letter S, with a greatest versed sine of 0.4 in. in a length of 13 in. Although the prism was so much bent that the radius of curvature was 24 in., the outer surfaces of the concrete showed no transverse cracks. Hence the deformation which occurred was not due so much to extension of the outer fibres as to compression of the inner fibres, which on calculation was found to be as much as 17 per cent.

Upon removal of the reinforcement the concrete was sufficiently cohesive to permit of its being handled without breaking. It was then placed on two supports about 3 ft. 7 in. apart, and required a weight of 55 lb. to break it by bending. One half of the prism which was less bent than the other, but had been subjected to the pressure of 7,940 lb. per square inch, was next placed on two supports 20.5 in. apart, and being loaded did not break across until a weight of 428 lb. had been applied. The diameter of the concrete, after the reinforcement had been taken off, was reduced to about 4.75 in., and the tensile resistance, judged by the last mentioned test, was calculated at 205 lb. per square inch, or very little below the original tensile strength of the concrete.

Compression tests made on specimens of hooped concrete, short enough to be loaded without causing flexure, showed longitudinal shortening of 3 per cent., or less, before failure.

Some other hooped specimens were tested under compression. The first, made of concrete mixed in the proportions stated above, bent under a pressure of 6,970 lb. per square inch, and was shortened 0.6 per cent. After removal of the reinforcement, the average compressive resistance of the plain concrete was 1,420 lb. per square inch, but its real resistance was considerably more, as the pressure was not applied quite accurately.

A second test was made with greater precautions on a hooped specimen, mixed in the proportion of 630 lb. of Portland cement to 1 cubic yard of gravel and sand, and this withstood a pressure of 10,270 lb. per square inch, with a longitudinal shortening which averaged 2.4 per cent., and did not exceed 2.8 per cent. in any part.

After removal of the reinforcement, the concrete core sustained a pressure of 9,700 lb., or, as the sectional area was about 10.5 in., nearly 924 lb. per square inch.

The foregoing examples are selected from a large number of similar tests, and they serve to demonstrate the remarkable qualities acquired by concrete when surrounded by a continuous metal sheathing, and also when bound with spiral coils of wire.

From the experiments made in this direction, M. Considére concludes that hooped concrete is capable of sustaining without failure considerable longitudinal shortening; that even after the most severe treatment it retains the greater part of its original resistance; and that when subject to the small amount of deformation which is experienced in actual practice, concrete reinforced in this way should be regarded as possessing constant resistance from the time the maximum is reached.

The relative effect of different methods of reinforcement for columns may be made clear by considering a cylinder of simple concrete not long enough to develop flexure when under compression. The application of pressure will result in longitudinal shortening and lateral bulging.

Let us assume that to such a cylinder four thin steel rods be applied for longitudinal reinforcement. On the application of pressure to concrete and steel alike, the concrete will be compressed at the top and swelled out to a barrel-like shape, as in Fig. 47. The steel will also bend outward owing to the lateral thrust exerted by the concrete, and in consequence of the load imposed, for while the concrete cylinder does not bend like a column, the steel does so bend owing to the small diameter of the rods in proportion to their length. These rods give very little support to the concrete, and they do not to any appre-

* Proc. Am. Soc. C. E. Vol. xxix., March, 1903.

* "Le Génie Civil," 1902, Paris: "Beton & Eisen," Vienna.

ciable extent help to restrain it from extending laterally. This is an extreme case, and the conditions are purposely exaggerated.

Now let us assume a cylinder of concrete armoured with welded steel hoops or rings, as in Fig. 48, which shows part of the cylinder. Here the concrete is prevented from bulging except between the hoops, and a certain amount of assistance is thereby given. In Fig. 49, the hoops are closer together, and there is a still further reduction in the amount of lateral swelling, with a proportionate increase of resistance. In Fig. 50 spiral coils are applied instead of detached hoops, and the effect is naturally more continuous throughout the length of the column.

These illustrations are purely diagrammic, and are merely intended to suggest in a general way the influence of reinforcement applied in the manner stated.

BOOKS RECEIVED.

AIDS TO THE MATHEMATICS OF HYGIENE. By R. Bruce Ferguson. Second edition. (Baillière, Tindal, and Cox. 2s. 6d.)

GEOMETRY FOR TECHNICAL STUDENTS. By E. H. Sprague, A.M.Inst.C.E. (Crosby Lockwood and Son. 1s. 6d.)

REPORT ON PROSPECTS OF BRITISH TRADE IN SOUTH AFRICA. By Henry Birchenough. (Eyre and Spottiswoode. 1s. 6d.)

Correspondence.

BRIGHTON HOSPITAL FOR WOMEN COMPETITION.

SIR,—As a competitor, I wish to call your attention to the extraordinary proceeding in connexion with the above competition. Shortly after the designs were sent in, an invitation was issued by the Committee inviting competitors and the general public to an "at home" to inspect the designs; but a few hours before that function the competitors received a notice informing them that they (the competitors) would not be allowed to attend.

The award was eventually made, and we have now received notice that we shall only be allowed to inspect the selected designs.

Was not this an extraordinary way of treating the competitors? Surely they, after spending so much time and money, should have been placed on the same footing as the general public. I really think the Committee ought to have given them an opportunity of inspecting the whole of the drawings, so that a full comparison might have been made, thus enabling them to benefit by any salient points that might have struck their notice in any one of the designs.

COMPETITOR.

OBITUARY.

MR. HIBBERT.—We have to announce the death, on November 19, at his residence, Ashby Folville, Anerley, Surrey, of Mr. James Hibbert, aged seventy years. Mr. Hibbert was formerly in practice as an architect in Preston, Lancashire. He made the plans and designs for the Preston and County of Lancaster Royal Infirmary, near Deepdale-road, which was built in the Italian style in 1868-9, at a cost of 18,000*l*., and comprises a pavilion having two floors for seventy-six beds, and an infirmary with detached wards for thirty-two beds, for infectious cases, erected at the charges, 7,000*l*., of the late Mr. E. R. Harris. He was the architect also of the Harris Free Library and Museum in Lancaster-road, Preston, which was built in 1882-93, at a cost of 80,000*l*., provided by the Harris trustees, on a site, valued at 30,000*l*., given by the Corporation. The principal front, which is after the Ionic order, is 130 ft. long, and has a massive hexastyle portico with fluted columns; the figures in the tympanum, representing the School at Athens in the age of Pericles, were sculptured by Mr. Roscoe Mullins from a general design by Mr. Hibbert. The building, which forms one of the most important of its kind in the county, has an entrance-hall and staircase rising to the upper floor; the principal floor contains the reference and Shepherd libraries and a museum of casts, and copies from the antique; the upper floor was planned for the museum and art galleries, the Newsham collection of pictures and drawings of the British School that is valued at 40,000*l*., the lending and patents libraries, reading and newsrooms, and the models and fine art exhibits; the shelving in the libraries has a capacity for 90,000 volumes. Mr. Hibbert took a prominent part in the municipal affairs of the borough; he was an Alderman, a member of the Town Council, and had served as Mayor.

MR. MARTIN.—We have also to announce the death, at Brighton, on November 24, of Mr. James Edward Martin, M.Inst.C.E., and late Secretary to the Government of Bengal, Public Works Department. Mr. Martin was elected an Associate of the Royal Institute of British Architects in 1874, and a Fellow in 1883. He prepared the plans and designs for the clock tower at Delhi.

GENERAL BUILDING NEWS.

PRIMITIVE METHODIST CHAPEL, SCARBOROUGH.—The foundation-stones were laid recently of the Seamer-road Primitive Methodist Chapel. The new building, which is on a site immediately in front of the existing building, will be of red brick, with stone facings. The present chapel will become the schoolroom proper. The ground-floor of the chapel will accommodate 275 persons, and there will be two aisles, with pews on either side and in the middle. The gallery will accommodate 180 persons. The choir and organ are to be placed immediately behind the rostrum, and there will be accommodation for a choir of over fifty. The transepts and other seats will provide seating for sixty persons, thus making a total accommodation of 563. There will also be provided a minister's vestry, etc. The architect is Mr. J. Caleb Petch, whose plans were selected in competition, and the contractors are Messrs. Hunter and Smith (brick, masonry, and plastering), Mr. T. Wilcox (joinery), Mr. F. W. Rudeforth (slating), Mr. J. C. Gill (plumbing), Messrs. Appleby and Brogden (iron work), and Mr. James Carr (painting). The estimated cost of the whole building is 1,600*l*.

CONGREGATIONAL CHURCH, PONTYPOOL.—The foundation-stone of the new Mount Pleasant Congregational Church and Sunday Schools, Pontypool, which are to be erected at a cost of 6,000*l*., was laid recently. The new church will occupy a site facing the main road and overlooking Hanbury Park. It will be in the Early English style. The main window of the first elevation will be of stained glass. Accommodation will be afforded for 550 worshippers. The architects are Messrs. Swash and Bain, Newport, and the builders Messrs. Leadbeter Bros., Newport.

CONGREGATIONAL CHURCH, DOVER.—The foundation-stone has just been laid of the new church to be built by the Dover Congregationalists at a cost approaching 7,000*l*., at the foot of Priory-hill. The church is designed in a modified form of the Decorated Gothic. Accommodation is provided for a congregation of 647 persons. Kentish rag, with Corsham stone dressings, are used for the external walls. There are three classrooms at the back of the church, and lavatory accommodation is provided. Electric lighting will be used throughout. The heating arrangements are to be carried out on the hot air principle. There will be galleries on three sides of the church, which will be approached by two stone staircases from the vestibule. The contract for the building is 6,182*l*., including the boundary walls and railings. Messrs. R. and G. Brisley are the builders, and the work is being carried out from the designs and under the superintendence of the architects, Messrs. Cresswell and Newman and Mr. W. Beeston as joint architects.

CHURCH, WEST JESMOND.—The foundation-stone of the new church in West Jesmond, Newcastle, dedicated to St. Hilda, has just been laid. Mr. Charlewood is the architect for the new church, and Mr. Hepple the builder.

RESTORATION OF TOYNTON ALL SAINTS' CHURCH, LINCOLNSHIRE.—The Church of Toynton All Saints, in the deanery of Bolingbroke, Lincs., which is now under repair and restoration, has been found to contain a thirteenth-century arcade in the south wall and a Norman arcade in the north wall. These were not discovered till the plaster was removed. The north arcade, which is much damaged by fire, is in a weak state, and needs underpinning, but the Bishop, the Rural Dean, and the Rector are of opinion that it would be a great pity that the arcades should be built up again for lack of funds. To display them will add 250*l*. to the cost of the restoration. The architect is Mr. Harold Bailey, of Newark-on-Trent. It may be added that the south arcade, which is of the Decorated style, consists of four bays. There are two limestone pillars, octagonal in shape, but standing on square bases. Three of the arches are quite perfect, but one has at some time been cut away, to make room for a window to give light to the west gallery. The Norman arcade, which is probably two centuries older, has five bays, of about 9 ft. each. The pillars are round, with carved capitals. The two arches which have so far been cleared show traces of the Norman custom of coating sandstone with plaster, and then painting the plaster. When the arches were built up in the fourteenth or fifteenth century the brickwork was plastered and the plaster adorned with ornamental lettering.—*Times*.

LLANDOVERY COLLEGE, WALES.—The new buildings of Llandovery College have just been opened. The buildings are of blue stone from Swansea and red sandstone from Cylrychen, near Llandebie, with dressings of Staffordshire brick. The buildings contain a tiled kitchen and servants' offices, a dairy, bread store, hot and cold meat larders, and a bakery. On the ground floor are a couple of new classrooms. The new scheme also provides for the transformation of the old dining-hall into two more classrooms. Occupying a good half of the ground space on the ground floor is the new dining-hall, which measures 71 ft. by 28 ft., or 8 ft. longer than the present school-hall, and is lighted by two windows in the Tudor style, with ten lights to each; two other large windows with six lights, and a centre window with two lights. On the first floor are four studies—each for four boys—and further along the corridor are five baths, with concrete flooring. In the lavatories lockers are constructed. There are several new dormitories. Each room contains from eight to ten beds. In the corridors are lockers for the boys' clothes and suits, and leading off the passages are a sick-room, matron's-rooms, and an airing-room. Various alterations have been made to the old buildings. The architects were Messrs. Paley and Austin, of Lancaster, and the builder Mr. G. Mercer, Llanelly.

BUILDING SCHEME, STECHFORD, WORCESTERSHIRE.—In the near future effect is to be given to a big building scheme at Stechford. An estate of fifty-two acres has been acquired, and a newly-formed company, with a capital of 20,000*l*., is to exploit the area for the building of house property. On the one side the estate extends along the railway towards Marston Green as far as the lane leading over to the Lea Hall Tavern. Diagonally a line cutting through the middle would stretch from the vicinity of the Bull's Head at Stechford to within forty or fifty yards of the Yardley Arms Hotel. It is stated that there is accommodation for between nine hundred and a thousand houses. A few of these on the lower or north side of the railway will probably be let at 7s. 6d. or 8s. per week, but in the case of those across the line the rental will be 9s. or 10s. Each house will have a bath, and the company is to plant the gardens with a number of fruit trees, and in other ways—by means chiefly of horticultural prizes—induce the tenants to take an interest in their gardens. The streets are also to be lined with avenues of trees, and there will be two miles of roads. To avoid the monotony of style so common to suburban Birmingham, it will be stipulated that not more than four houses shall be exactly alike. —*Birmingham Post*.

RESTORATION OF TIDESWELL CHURCH, DERBYSHIRE.—At a meeting of Tideswell Church officials it was decided to proceed with the work of restoration. Mr. Oldrid Scott, architect, of London, has been engaged, and will shortly prepare detailed plans, and a faculty for the removal of the gallery will then be obtained. The south doors of the church are in a dilapidated condition, and some unknown parishioner has offered to place new ones of design prepared by Mr. Scott. The west end of the tower has been pointed, and one or two missing stones replaced. The heating of the church has just been improved by Messrs. Newton, Chambers, and Company, of Sheffield; new silver Communion vessels have been given by the Vicar and Mrs. Fletcher; and many improvements have been effected in and around the building.

BUILDING DEVELOPMENTS IN NEW LEEDS.—Whilst there is talk of extending the city of Leeds beyond its present borders, it is interesting to note the signs of growth and expansion within the existing area. One of the most notable of these developments is that now in progress on the west side of Chapeltown-road, on what was known for years as the Earl of Mexborough's estate. The last eight or nine months have been occupied in levelling and laying out, and in constructing roads. This work has now been nearly finished, and the first block of houses is in course of construction. Over five thousand lineal yards of new streets are in course of construction, some 36 ft., and some 42 ft. wide. One of these thoroughfares, to be known as Savile Mount, will be practically a continuation of Leopold-street into Buslingthorpe-lane. Another street will, it is expected, before very long be carried right through the estate into Meanwood-road, emerging not far from the Destructor. Hall-lane, at the top of Reginald-terrace, is to be continued to Buslingthorpe-lane, at a width of 42 ft., and that, no doubt, will to some little extent relieve Chapeltown-road of heavy traffic. Only one or two of the building plots facing Chapeltown-road have yet been disposed of. One of the collateral advantages of the Mexborough estate

coming into the market is that the Leeds Corporation are enabled to contemplate a much-needed widening of Chapeltown-road. A strip of about four yards has in anticipation been thrown into the footpath for the entire length of the estate.—*Yorkshire Post.*

CONGREGATIONAL CHURCH, CAERPHILLY.—The foundation-stones of the new Congregational Church have just been laid at Caerphilly. The new edifice is being erected upon a corner site in Van-road, adjoining the present chapel. Mr. W. Beddoe Rees, of Cardiff, is the architect. On the lower floor are arranged the church parlour, two vestries, four class-rooms, kitchen, lavatories, etc. The chapel is on the floor above, and will accommodate 500 without galleries. The building is being built with local stone, with blue Newbridge stone facing, and Doulton stone dressings. The woodwork throughout is of selected pitch-pine. The total cost will be about 3,000*l*. The work is being carried out by Mr. J. Howells, builder, Caerphilly, under the supervision of the architect.

OFFICES FOR THE EYRE ESTATE, ST. JOHN'S WOOD.—New offices for the trustees of the Eyre Estate, have been erected on the site of No. 125, Park-road, St. John's Wood. The plans and designs were made by the late Mr. Eley White, and have been carried out under the directions and superintendence of Mr. H. O. Cresswell.

WESLEYAN SUNDAY SCHOOL, LONG EATON.—On the 24th ult. the new Wesleyan schools at Derby-road, Long Eaton, were opened. The schools adjoin the school chapel, off College-street, and form part of a scheme for a new church with a school, costing 10,000*l*. Messrs. Brewill and Bailey, of Nottingham, are the architects, and Messrs. Vickers and Son, Nottingham, the builders. The building comprises ten classrooms, two large enough for 100 scholars each, and may be used as a meeting-room. The heating arrangements are by Messrs. Danks and Co.

THEATRE ROYAL, BIRMINGHAM.—The new Theatre Royal, Birmingham, is to be erected from the designs of Mr. E. Runtz, of Messrs. Runtz and Ford. The main entrance will face New-street, but inside the structure varies from the old Theatre Royal in that the stage, instead of abutting upon Colonnade-passage, will adjoin Stephenson-street. The chief entrance will be situate at the Colonnade end of the frontage. The latter is nearly 82 ft., and the remainder will be devoted to four shops. The gallery will be approached from a private twenty-feet way leading from Stephenson-street, and there are to be two exits on the opposite side of the building leading into Colonnade-passage, while access will be gained by means of three staircases. The entrance to the upper circle and pit will also be in Colonnade-passage, and exits for occupants of the dress circle and stalls are to be provided on that site. The principal entrance is provided with a large crush room some 22 ft. by 19 ft., from which stairways lead on the right to the dress circle and on the left to the stalls. Altogether the exits will number twelve. The box-office is to be placed on the right-hand side of the main entrance. The area of the house is to be divided into stalls, pit stalls, and pit, with refreshment rooms for both departments. Behind the dress circle is to be a foyer saloon, with raised alcove or recess. In the gallery there will also be a large saloon, with the usual lavatory accommodation. The approximate seating accommodation is as follows:—Stalls, 230; pit stalls and pit, 520; dress circle, 350; upper circle, 440; boxes (of which there are to be twelve—three on either side of the stalls level, and three on either side of the dress circle level), 48· and gallery, 672; making a total of 2,260. The proscenium opening is to be 34 ft., and the stage itself 73 ft. wide, with a total depth of 48 ft. The building will comprise five stories, and will be built of red brick or terra-cotta and stone. Surmounting the erection is to be a group of statuary.—*Birmingham Mail.*

NEW TOWN HALL FOR LAMBETH.—On Thursday of last week the Town Clerk of Lambeth reported to the Borough Council that the occupiers of all the houses on the site acquired at the corner of Brixton-hill and Acre-lane for a new Town Hall would give up possession at Christmas or within a fortnight after. The only interest outstanding was the freehold interest in a strip of land facing Brixton-hill, and notices for the acquisition of this under the order had been served. It was estimated that the total cost of the site would be 25,425*l*.

CO-OPERATIVE STORES, BIRTLEY, DURHAM.—New central premises have been erected on the Durham-road, Birtley, by the Birtley District Co-operative Society. The building contains on the ground floor rooms for the carrying on of the grocery and provision business, drapery, butchering, cafe, furnishing, boots and shoes, millinery, greengrocery, jewellery, etc., with all the necessary warehouses at the back. The second story contains rooms for the tailoring, halls to seat 800 and 300 respectively, newsrooms, billiard rooms, board rooms, and the various offices for the general staff. The building, when finally completed, will have cost about 25,000*l*. The architects are Messrs. Liddle and Brown, Newcastle, whilst the building itself has been erected by the society's own staff, under Mr. Jobling.

ST. MARK'S, BROADWATER DOWN, TUNBRIDGE WELLS.—This church, designed in the sixties by the late R. L. Roumieu, has recently had added to it a choir vestry, harmonising with the architecture of the original structure. Opportunity has also been taken to improve the choir seating, position of prayer-desk, and lectern, and to substitute marble steps into the chancel for the Portland stone ones. A baptistry has been built at the west end of the church, into which the font has been moved, and stained-glass windows by Messrs. Clayton and Bell fill the lights. The whole of the additions and alterations have been carried out by Mr. Harry Mansfield (Messrs. George Mansfield and Son) of Tunbridge Wells, whose father built the church. The architects are Messrs. Roumieu and Aitchison, of London.

CHURCH, WEALDSTONE, MIDDLESEX.—Two more bays of the nave and aisles of Holy Trinity Church were consecrated on the 24th ult., which now completes the original plan, with the exception of the spire. The concrete foundations for the whole edifice had been put in at the time the building was started, but, one of the societies which gave a grant stipulated that the west wall should be a temporary one, so that the church could be hereafter lengthened to meet the requirements of a rapidly growing district. The style is Early English; the exterior is of Kentish rag with Bath stone dressings and windows; the latter both in aisles and clearstory having a narrow band of red brick in the external arches. The roof is of green slates. The architects are Messrs. Roumieu and Aitchison, of London; and Messrs. Webster and Cannon, of Aylesbury, are the contractors.

CHURCH, MARSDEN COLLIERY.—The new Church of St. Andrew at Marsden Colliery, near South Shields, was opened recently. The new place of worship is a stone structure, erected from plans prepared by Messrs. J. Potts and Son, architects, Sunderland; Messrs. W. D. Allison and Son, Whitburn, being the contractors. There is sitting accommodation in the nave for 200 persons. The outer walls are of Marsden limestone, with freestone dressings, and the internal fittings and seats are of pitch pine.

ALL SAINTS' CHURCH, WIGSTON MAGNA.—This church has been opened recently after undergoing alterations and repairs. The organ has been renovated and restored, and a new organ chamber has been built. The chancel floor has been raised four steps, and repaved with Portland stone and Dumfries stone squares in the choir, and Portland stone and marble squares in the sanctuary. Under the stalls the flooring is of wood blocks. The new stalls for priests and choir are in wainscot oak, and comprise traceried fronts, with monogram of the donor, and carved poppy heads. There is a new altar rail, also in oak, and reredos, of which the upper panels are linen moulded, and the carved centre frame filled with a stamped velvet dossal, having gold applique work. The sedilia is fitted with cushions and hangings; there is also a new stove, with copper screen. The old priests' door in the chancel has been preserved and repaired. The chancel is lighted with hammered wrought iron brackets and incandescent gas lamps. The architect for the whole was Mr. H. T. Goddard, of Leicester.

BANK, BELFAST.—New premises are about to be erected in Belfast for the Provincial Banking Company. The plans have been prepared by Messrs. Carroll and Batchelor, architects, Dublin. Messrs. M'Loughlin and Harvey, of Belfast and Dublin are the contractors.

NEW BANK, MANCHESTER.—The new head offices of Parr's Bank, in Spring-gardens and York-street, Manchester, are to be opened on Saturday, the 15th inst. The building has been designed and completed in all its branches by Manchester firms. The exterior of the building, which is designed in a modern Renaissance style, is of red Carlisle stone, the roof being of green slates and the dome surmounting the tower of copper. The bank occupies the whole of the ground floor and basement. The latter floor is practically in two portions, one portion being given up to the various strong rooms, the other half to the various rooms usually assigned to the clerking staff of a large bank. On the groun floor the whole of the interior is lined with marble, and the woodwork is of dark stained mahogany. A feature of the banking chamber is the saloon roof over the clerks' portion. This roof is treated with enriched fibrous plaster work and leaded glazing. The large windows of the bank are framed in bronze. The whole of the upper floors, three in number, are divided up into offices for letting. The Plenum system of ventilation has been adopted throughout the building. The contractors are Messrs. Neill and Sons, Manchester, and the architects, Messrs. Chas. Heathcote and Sons, also of Manchester.

SANITARY AND ENGINEERING NEWS.

PENN AND PENN FIELDS SEWERAGE.—At a meeting of the Seisdon Rural District Council recently, the tender of Mr. Herbert Holloway, of Wolverhampton, amounting to 11,970*l*., was accepted for the carrying out of this sewerage scheme, in accordance with the plans and specifications prepared by Mr. R. E. W. Berrington, M.Inst.C.E.

WORCESTER SEWAGE DISPOSAL.—A further stage has been reached in the matter of the purification of the sewage of Worcester. It will be remembered that pressure has been put upon the Worcester authorities to take some definite step with regard to the purification of the sewage of the city, and accordingly a deputation from the Council in June of this year made a comprehensive examination of various well known methods of sewage treatment, visiting amongst other places Exeter, Uxbridge, and Redhill, with the result that their report was in favour of the Oxidation Sprinkler Bed methods in operation at the two last-named places. Mr. T. Caink, A.M.Inst.C.E., the City Engineer, in accordance with his Council's instructions, has recently prepared a scheme upon the lines of the methods employed by the Redhill Corporation and the Uxbridge Council, and the Local Government Board having given their sanction, it is now proposed to carry out the scheme, which includes disintegrating tanks with Bacterial Oxidation Beds, on which the sewage will be distributed by means of Candy-Caink Revolving Sprinklers, and a tender has been accepted by the Council for the first portion of the purification works, the amount of the tender for the disintegration tanks being 7,404*l*.

STAINED GLASS AND DECORATION.

STAINED GLASS WINDOW, BISHOPTON CHURCH, NEAR STOCKTON.—A new stained glass window has been placed in St. Peter's Church, Bishopton, near Stockton. The new window consists of two bays, in both of which the figure of Christ is shown. Messrs. Wailes and Strang, Newcastle-on-Tyne, carried out the work.

WINDOW, WELLS CATHEDRAL.—A new window has just been unveiled in the north transept of Wells Cathedral, in memory of Somerset men who fell in the War in South Africa. The general subject of the window may be described as "Kings and warriors in the making of England, centring in Alfred the Great." The work has been designed and carried out by Messrs. James Powell and Sons, London.

SELWYN COLLEGE, CAMBRIDGE.—In continuation of a scheme which is being gradually accomplished, a window has been inserted in the college chapel, and dedicated to the memory Arthur Temple Lyttelton, late Bishop of Southampton, who was the first Master of Selwyn College. The window was designed, as well as the others in the chapel, by Mr. C. E. Kempe; it contains figures of St. Luke, and Auskar, and Boniface.

ST. SAVIOUR'S, SOUTHWARK.—A new window, representing St. Augustine, Bishop of Hippo, and designed by Mr. C. E. Kempe, has been inserted in the north aisle at a cost of about 80*l*., subscribed by friends of the late Mr. James Frederick Field, Assistant-Treasurer of the Collegiate Church and Member of the Chapter. The corresponding window in the south aisle, representing St. Swithin, was given by Mr. Field, in memory of his father.

MEMORIAL WINDOWS, HAMSTERLEY.—Two memorial windows to the late Viscount Gort have been erected in Christ Church, Hamsterley. The east window represents the Ascension, the west one St. John the Evangelist and St. John the Baptist. The work has been executed by Mr. G. J. Bagaley, Newcastle-on-Tyne.

FOREIGN.

FRANCE.—It is proposed to erect a statue to Cervantes near the Avenue Marigny, on the Champs Elysées, Paris.——A colossal statue of Corneille is to be erected, next year, on an elevation in the outskirts of Rouen. The sculptor is M. José de Charmoy, and the statue will be grouped with two other figures representing two of the heroines in Corneille's dramas, Chimène and Camille.——A competition has been opened, for Architects of the Department of the Loire and the adjoining Departments, for a new savings' bank at Montbrison.——A new museum is to be built at Albi.——The architectural models of the Parthenon, the temple of Pæstum, the Coliseum, etc., now in the Ecole des Beaux-Arts at Paris, are to be transferred shortly to the Museum of St. Germain.——M. Chédanne, the well-known architect, has been promoted to be "Officier" of the Légion d'Honneur.——The

jury of the Ecole des Beaux-Arts for the competition in decorative composition, has awarded the first medal to M. Cayou, a pupil of M. Deglane.——M. Emile Bertone, author of some valuable studies on the ruins of Palmyra, has been appointed architect to the Société de Géographie, in succession to the late M. Leudière.——M. Guadet, architect to the Palais Royal, has presented to the Musée des Arts Decoratifs the fine wood-carvings and columns once belonging to the apartments of the Regent, and executed in the eighteenth century after the designs by Oppenordt.——The jury in the competition for the new building for the Chamber of Commerce at Limoges, have awarded the first premium to M. Planckaert, of Limoges.——A Lycée for girls is to be built at Valenciennes, at a cost of 800,000 francs.

United States.—The project for a wide street from Copley-square, in Boston, to the Broadway-bridge, has been revived. Copley-square is becoming every day a more important centre of traffic, and, while it has five long streets diverging from it to the north, west and south, it has toward the east only one. It is expected that the cost of the land taken for this improvement will soon be repaid by the improvement of the property on both sides, which has been lying idle for several years.——The City of Buffalo has just entered upon the establishment of an architectural bureau in the Department of Public Works, where plans are to be made for the various buildings required by the city.——An organisation of employers has been recently formed at a conference in Chicago, to be known as the Citizens' Industrial Association of America. Its purpose is to "assist by all lawful and practical means the properly constituted authorities of State and nation in maintaining and defending the supremacy of the law, and the rights of the citizen"; as well as to "encourage harmonious relations between employers and employed."——The new licence law for architects in New Jersey has already given occasion for several controversies. In one case, an elderly member of the profession, who had long ago retired from active practice, was brought before a court, charged with practising without a licence, on account of some trivial professional service which he had rendered, and was only released on promising not to offend further. Recently, the two members of the firm of Benner and Son, of Bradley-beach, were summoned into court, to answer to the same charge. It is reported that they propose to resist the operation of the law.

Germany.—A new Museum in connection with the Art Schools has been built at Flensburg in Schleswig Holstein. The architects, K. Mühlke and F. v. Gerlach, have succeeded in forming a group of buildings which are worthy of their position on the high ground overlooking the town, and which recall the characteristics of the Mediæval North-German Architecture.——In Cologne a new theatre has been completed; the architect is Herr Karl Moritz. Special care has been given to the heating, lighting, and ventilation of the building.——A book has been published in Leipzig entitled, "Country Churches. Designed and executed by the Architects Schilling and Graebner" (Landkirchen, Entworfen und ausgeführt von den Architekten Schilling und Graebner.) In this the architects have shown that they have endeavoured to design churches for country towns that, whilst answering all requirements, are not out of keeping with their surroundings, and that tend to raise the artistic taste of the people.——In Berlin, the new Government Buildings in Wilhelmstrasse have been completed. The architect is Herr Kieschke.——An International Congress will be held at Nüremberg in April, 1904, to discuss the question of hygiene in schools. The Chairman of the German Committee is Professor Griesbach, and the General Secretary of the Congress is Dr. Paul Schubert.——The restoration of the Castle at Mannheim is now completed. The work has been in progress for seven years, and has cost 1,250,000 marks.——The new museum at Augsburg is to be carried out according to the plans of Herr Walter Krauss, and will be in the same style as the museum at Stuttgart.

Austria.—The architect Camillo Sitte, the Director of the Technical Schools at Vienna, died on November 16, in his sixtieth year. Sitte is most widely known by his work on "The Building of Towns on an Artistic Basis" (Der Städtebau nach künstlerischen Grundsätzen) which has been translated into French and English.——An important building for the shelter of the homeless has been opened in Vienna. The architect is Herr Fleischer.

Switzerland.—As the new bridge across the Rhine, which is in process of construction at Basel, is to be on the site of the old one, a temporary bridge is to be built in order to relieve the traffic. Messrs. A. Buss and Co. and P. Holzmann and Co. have been entrusted with the construction of both bridges.

MISCELLANEOUS.

Advertisement for "Architect's Managing Assistant."—An advertisement for the above appeared in our issue of the 21st ult., replies to be sent to "Architect," to an address in Chancery-lane, the real object of which, we regret to find, was not what appeared on the surface, and was what we strongly disapprove of. One or two readers who responded to it have sent us the reply they received, and we need hardly say that, had the publisher suspected the real object of the advertisement in question, it would not have been inserted.

Scarborough Master Builders' Association.—The annual meeting of the Scarborough Master Builders' Association was held on the 21st ult., the President (Mr. A. W. Sinclair) occupying the chair. The following officers were elected:—President, Mr. A. W. Sinclair; vice-president, Mr. R. H. Carr; hon. secretary, Mr. Fred Hardgrave; auditor, Mr. W. Malton. Representatives were also elected to attend on behalf of the Association at the half-yearly meetings of the National Association of Master Builders of Great Britain and Ireland, and the Yorkshire Federation of Building Trade Employers. After seven years' greatly appreciated work as hon. secretary, Mr. R. H. Carr resigned, and was heartily thanked for his services, being also elected vice-president of the Association.

Non-Flammable Wood.—The Non-Flammable Wood and Fabrics Co. send us a specimen slab of wood treated by their method, which has been impregnated throughout its substance with fire-resisting ingredients. We have tested it in flame, and it will not burn, but only chars. We may add a few rules from the circular sent with the specimen as to the process. It consists, as regards wood, in submitting the latter to a series of operations consisting of, first, a vucuum treatment by which the pores are opened and partially cleansed; second, a treatment of saturation with a fire-proofing solution throughout the various pores and tissues; and, third, the evaporation of the water of the solution from the wood, the whole resulting in rendering the wood incapable of spreading flame, causing it instead, when subjected to fire, to merely carbonise slowly at the point of contact with the flame. The woods that lend themselves best to successful treatment are ash, beech, birch, chestnut, deals, elm, firs, mahogany, pines, walnut, whitewood. Oak and teak are more difficult to treat, and require a special process. The time for treatment varies according to the description and thickness of the wood to be treated, and occupies, including drying (from twenty to forty days, but the company keep large quantities of stock timber on supply. The comparative cost of non-flammable wood varies from 1-7th to ¼ in. in excess of the cost of untreated wood, according to the class of work and thickness of wood treated.

The Sanitary Institute.—At an examination in practical sanitary science, held in Manchester on November 20 and 21, four candidates presented themselves, and the following two candidates were granted certificates:—T. B. Hetherington (Carlisle); G. Bottomley (Lindley, Huddersfield).

Newnes' Technological and Scientific Dictionary.—Messrs. Newnes ask us to express their apology to our readers for their delay in the issue of the first part of their Technological Dictionary. Owing to the numerous references and verifications which had to be made, the publishers are compelled to delay the publication of the first number until January. Readers of our advertising columns will have seen their advertisement; but, for the benefit of those who have not done so, Messrs. Newnes will be pleased to send a complete prospectus on application.

St. George's Chapel, Albemarle-street, W.—This proprietary chapel has recently been closed, the trustees having sold the building for business purposes. The chapel, of which the late Rev. Dr. Ker Gray was the last incumbent, was originally built in 1810, and contained 1,200 sittings. The interior was modernised and redecorated at a considerable outlay some while ago. The organ, having two manuals and 22 stops, was built by J. C. Bishop.

Church of St. Columba, Haggerston.—In response to the petition of the vicar and churchwardens, the Chancellor of the Diocese of London has agreed to issue a faculty authorising the building of a mortuary chapel adjacent to the north wall of the church and upon some land which belongs to the church. The petitioners represented that the small parish has a population exceeding 7,000 persons, mainly of the poorer class, and that for sanitary reasons the provision of some such resting-place apart from their own crowded homes was greatly needed. St. Columba's Church, in Kingsland-road, was built in 1868-9, after plans and designs by the late James Brooks. It is cruciform on plan, and forms a typical example of that architect's work.

Railway Sleeping Accommodation.—The English railway companies have done wisely in at once reassuring the public on the subject of the cleanliness of the sleeping-car accommodation after the alarmist reports circulated by the *Lancet* in connexion with the treatment of the bedding and blankets in the United States on some of the railways there. Seeing the immense convenience to passengers of sleeping accommodation on long journeys, it would have been regrettable had inattention to such necessary details prevented the public from availing themselves of its advantages; but, as it is, public attention having been drawn to the subject can only tend to insure greater attention being given to the question of bedding, not only by the railway companies, but also in hotels.

Belgian Exports.—In his report on the commerce of Belgium for the year 1902, Mr. Hertslet, the British Consul-General, mentions that in the cement industry, the export trade did not show much sign of improvement as regards value, but in the matter of quantity it continued to grow, and showed an increase of 10 per cent. as compared with that of 1901. In this department, the enormous demand from the United States, amounting to 116,661 tons, as compared with 67,633 tons in 1901, and increased demands from Cape Colony (9,862 tons) and Canada (24,173 tons), played the chief part. 3,383 tons were sent to Australia, 6,085 tons to British India, and 1,943 tons to the Straits Settlements. The glass exports were well sustained, and, surpassing in value those of 1901, regained the high position they held in 1899. This increase was chiefly due to large orders from China, Japan, Canada, the United States, and Turkey. The iron and steel industries suffered, not only from local over-production, but from that in the neighbouring countries. A market, however, was found for a large quantity in the United States. The exports of iron and steel included 138,678 tons to the United Kingdom, 10,843 tons to Australia, 3,160 tons to Canada, 8,358 tons to Cape Colony, 65,633 tons to British India, and 5,697 tons to the Straits Settlements. The United Kingdom also took from Belgium 4,435 tons of lead, 121,585 tons of stone (of which 4,416 tons was worked, polished, or sculptured), 32,242 tons of timber, and 42,204 tons of zinc.

The Central Tower of Rochester Cathedral.—Mr. C. Hodgson Fowler has been appointed as architect for the re-building of the central tower of Rochester Cathedral. A donation of 5,000*l.*, lately given to the Dean and Chapter by Mr. T. H. Foord, a native of Rochester, will be applied towards the new works. The present tower, with its battlements and angle-pinnacles, is depicted in the late Mr. Brewer's drawing, published in our columns of October 3, 1891. The tower was recased, and raised as we now see it, during the repairs that were begun in 1826 under the directions and superintendence of Cottingham, who pulled down the spire. In 1871 Sir G. Gilbert Scott began his reparation of so much of the fabric as extends eastwards from the nave, which portion had formed the church of the Benedictine monks, established there by Gundulph. The nave, partly built by Gundulph, had been the parish church of St. Nicholas. After the fire of 1179, and before the close of the twelfth century, the reconstruction of the crossing and transepts and the rebuilding of a central tower were commenced, but that work was shortly afterwards relinquished. Before the end, however, of the thirteenth century, the rebuilding of the south transept and the raising of the central tower clear above the roofs were accomplished, the two eastern piers of the tower, with the arch above them, having been built during the time of the Priors Ralph de Ros and his successor Helias, and the two western piers reconstructed somewhat later. Then, in or about the year 1343, Bishop Hamo de Hythe raised the tower, and added to it a spire constructed of wood, and during the middle of the eighteenth century Hamo's portion of the tower was rebuilt. We understand that Mr. Fowler's designs comprise a new spire to be constructed of oak and covered with lead.

The Art of Architecture.—The third of a series of lectures on architecture by Professor Beresford Pite, was given at the Technical Schools, Leicester, on the 27th ult. The lecturer first dealt with materials in relation to design of details. There must, he said, be an essential sympathy between the designer and the materials employed, whether it was in the representation of architectural form or natural form. A building designed in intelligent sympathy with the materials employed had a style of its own. The brick building differed in constructive nature as well as in appearance from the stone building, and it was necessary to realise the importance of these distinctions. Although it might be rank heresy to say it there was no real reason why a building should not look at its best when it was smart and new. A new building with new materials would become

beautiful when there was sympathy between design and material. In the past they had been so completely chained down by their rose-coloured views of antiquity that unless their buildings were old they did not see beauty in them. With sympathy between design and material a new building could be beautiful, even though untouched by the heavy hand of time. The lecturer afterwards discussed treatment of details in English Renaissance domestic buildings, including panellings and stone mouldings. A criticism of students' work followed.—*Leicester Post.*

PATENT OFFICE.—An open competitive examination for not fewer than twenty-four situations as assistant examiner in the Patent Office will be held by the Civil Service Commissioners in January next. The examination will commence on the 5th of the month, and forms of application for admission to it will probably be ready for issue in the course of a few days; they will be obtainable on request addressed by letter to the Secretary, Civil Service Commission, Burlington-gardens, London.

THE INTERNATIONAL SOCIETY OF SCULPTORS, PAINTERS, AND GRAVERS.—At a Council meeting of this Society held on December 2, Monsieur Rodin was elected President, in succession to the late Mr. Whistler.

THE DORE GALLERY.—This gallery has passed into the management of Mr. H. E. Nicholls, the former Secretary of the Continental Gallery in Bond-street. It is intended that it should be utilised for a more varied series of exhibitions, including what it is the fashion to call "one man exhibitions." The gallery has for many years appealed only to the popular taste of the artistically uneducated section of the public; it is to be hoped that it may now represent a better class of exhibitions.

ELECTRIC SUPPLY, LIVERPOOL.—Mr. A. B. Holmes, Consulting Electrical Engineer to the Liverpool City Council, has prepared a Report on the Corporation electric supply stations and plant, which has just been circulated amongst the members of the Council. Mr. Holmes points out that the demand for electrical energy for power and lighting continues steadily to increase, and it is estimated that the output of the supply stations for 1903 will exceed that of the previous year by the following percentages: Lighting, 20 per cent.; power 60 per cent.; and tramways, 5 per cent. The connexions to the supply mains for lighting and power (exclusive of tramways) at the commencement of the current year were equivalent to 221,000 c.p. incandescent lamps; and it would be necessary for the Electric Supply Committee to consider what extensions would be required to meet the demand for electrical energy which might be anticipated in 1904 and 1905. No more steam plant could be installed in the existing power stations in the central districts, and no suitable site was obtainable in these districts for another large steam station, by means of which the simplicity and economy of the generation of energy at the pressure of distribution to the consumer could be secured. It was consequently necessary to bring in an additional supply at high pressure from Lister-drive. Mr. Holmes presents a plan for coping with the emergency, and explains that if his proposals are approved the extensions for 1904 will be as follows:—(1) At Fairclough-lane, an addition to the building and 2,000 kilowatts transforming power; (2) at Oldham-place, an addition to the building and 2,000 k.w. transforming plant; (3) at Rice-lane, the construction of a sub-station to contain transforming plant of 800 k.w.; (4) at Cobbs Quarry, 800 k.w. transforming plant; (5) at Smithdown-road, 000 k.w. transforming plant.

LEGAL.

ALLEGED BREACH OF A BUILDING SCHEME.

MR. JUSTICE KEKEWICH in the Chancery Division last week concluded the hearing of the case of Dixon *v.* Thompson, an action by the plaintiff to recover from the defendant damages laid at 10,000*l.* for alleged breach of a building scheme or agreement that no business, trade, or manufacture should be carried on upon land at Sevenoaks, now or lately belonging to the defendant, and that nothing should be done which would be a nuisance and disturb any adjoining owner. Plaintiff also claimed damages for breach of an agreement by defendant not to sell any land to the South-Eastern and Chatham Railway Company, and for injury sustained owing to nuisance by noise by the railway company.

Mr. Astbury, K.C., and Mr. Methold appeared for the plaintiff; and Mr. Warmington, K.C., and Mr. Atkin for the defendant.

The plaintiff's case was that in 1885 he purchased from the defendant about eight acres of land and a house situate in the Hippington Park Estate, Sevenoaks, giving 10,750*l.* for it. His house was named "Edenhurst." The plaintiff alleged that the defendant formed a building scheme by which the estate was to be developed for high-class private residences only, with the usual stabling and out-buildings, and no business, trade, or manufacture was to be carried on, and nothing done to be a nuisance or annoyance to adjoining owners. The plaintiff afterwards purchased an additional eight acres of land, paying 500*l.* per acre, and there was a covenant that the land should be used only for the erection of private residences. The plaintiff's case was that he purchased on the faith of the building scheme; but the defendant in 1901 voluntarily sold to the Railway Company a piece of land adjoining the plaintiff's for the purpose of its being used as a quarry, and the Railway Company commenced quarrying in 1902, causing a nuisance or annoyance to the plaintiff.

The defendant by his defence denied that he formed any building scheme or offered for sale any portion of the estate subject to a building scheme, or that the piece of land sold formed part of the residential property. Defendant denied that the plaintiff purchased under any restrictive covenant or upon a building scheme. He also denied that the plaintiff had suffered any damage, and that he (defendant) had committed any breach.

Mr. Astbury, in opening the plaintiff's case, said the question was whether the plaintiff had been led to believe that there was a building scheme, and if he proved that he was, then, he submitted, he was entitled to succeed.

Plaintiff was then called, and in the course of his evidence said that after the purchase of "Edenhurst" he spent some 3,000*l.* or 4,000*l.* in improving it. At the time of his purchase the nature of the surrounding property was exclusively residential. In 1885 defendant approached him with a view to his adding to his land. Defendant told him that he was only selling the land for private residences, and he would require purchasers to enter into covenants to that effect to protect the rest of the property. Plaintiff agreed to enter into these covenants, and then selected about eight acres of additional land adjoining his property, which he purchased at 500*l.* per acre. He never would have bought if he had known that there was to be a quarry where it now was. He had seen no document which he could regard as a building scheme of the estate.

Mr. W. R. Crouch, F.S.I., Sevenoaks, gave evidence that, in his opinion the quarry was a nuisance and annoyance to residents on the estate.

Mr. Warmington, for the defendant, submitted that plaintiff had made out no case either for the building scheme or representations. It was clear that there had been no breach of any covenant.

Mr. Astbury: Yes, of an implied covenant.

Mr. Warmington said that the plaintiff purchased under a form of agreement approved by his solicitors. There was no fraudulent representation. The deed itself was dead against any such scheme.

Mr. Sidney Thompson, a solicitor, and son of the defendant, said that he submitted to the plaintiff's solicitor the draft agreement, and there was nothing to show any building scheme in connexion with the estate.

The defendant, whose evidence was taken on commission, deposed that no building scheme existed so far as his recollection went.

In the result his lordship, in giving judgment, said there was no doubt in his mind that no such scheme as was stated in the statement of claim existed, and there was no trace to be found of one in any of the documents. He thought that on all grounds the plaintiff's action failed, and must be dismissed with costs.

CAPITAL AND LABOUR.

BUILDING TRADE DISPUTE, ST. HELENS.—In consequence of a depression in the building trade and the bad weather, the employers of St. Helens have decided that the bricklayers and joiners in their employ shall start work at 8.30 each morning instead of seven o'clock. The employees of one of the firms in the town struck work on the 30th ult. The employers have very little work, and, owing to the new arrangements at the Town Hall that the plans of new buildings have to be submitted to the Highway Committee as well as the Health Committee, it is stated that inconvenience and delay are suffered, and the work of the employers is consequently interfered with. If the plans sent into the Health Committee are disapproved on the smallest technical objection it means a delay of five or six weeks before the plans can be rectified and passed before the two committees concerned. This the masters consider an unnecessary infliction upon them.—*Liverpool Post.*

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

21,480 of 1902.—G. H. ALEXANDER: *Kilns or Ovens, for Burning Cement, Plaster or Lime.*
A continuous working force draught kiln for burning cement and the like, arranged for the discharge of the burnt material clear of or away from the attendant.

24,023 of 1902.—J. C. MCCHENAHAN: *Process for the Manufacture of Stone.*
A process of making stone, which consists in saturating granulated moulding material with a hardening chemical solution, and then pouring a liquid stone composition on to the saturated moulding material, and leaving the stone composition to set and take up a facing or coating of the moulding material while absorbing the chemical solution and thus becoming hardened.

27,107 of 1902.—P. J. KOCH: *Device for Simultaneously Opening the other Wing of a Door if one Wing is Opened.*
A device for simultaneously opening or closing the other wing of a door if one wing is opened or closed, comprising in combination, a rail running at right angles to the front wall of the cupboard and fixed in the bottom of the same, segment shaped hinges fixed with one end to the door wings and pivoted at the other end in the door frame, two levers, each connected at one end with the inner end of the segment shaped hinge, and pivoted with the other end in a vertical pivot guided in the rail, two levers pivoted at one end to a pivot guided on the rail and linked with the other end to the middle of the first-mentioned pair of levers.

17 of 1903.—J. B. PEACE: *Window Sashes for Enclosing the Window Spaces of Band Stands, Shelters, Kiosks, and other Erections.*
Means for enclosing open window spaces of band stands, shelters, kiosks and the like, consisting in the employment of two or more window sashes, hinged together horizontally, and counterbalanced by one pair of weights common to the series of hinged sashes.

591 of 1903.—C. ROSENHEIM: *Fastening for Casement Windows, Fanlights, and the like.*
A fastening apparatus for casement windows, fanlights, and the like, comprising means for alternately closing and firmly securing within their frames, and releasing therefrom, and opening such windows or the like by successive pulls upon a cord, wire, chain, or the like.

17,250 of 1903.—A. D. S. DALGLEISH: *Door or Window Stops or Holders.*
Door or window holders consisting of projections, jointed or not, and springs or spring pieces, the projections having enlargements at their ends, and either the springs or spring pieces, or the enlargements, or both, being provided with sloping faces adapted to allow of engagement and disengagement of the enlargements on the projections with the springs or spring pieces by pushing or pulling the door or window.

13,867 of 1903.—W. A. HILDYARD: *Bolts or Fasteners for Doors, Windows, and the like.*
This invention relates to bolts or fasteners for doors and windows. The bolt is made so that on releasing a knob or lever the shoot is automatically shot by means of a spiral spring placed at the back of it, and also automatically locked. The knob or lever works in a cavity in the shoot, a small spring fastened to the shoot being utilised to give a downward pressure on the knob, so that, when the shoot is in its normal position, the knob falls into a slot in the top of the bolt, at right angles to the direction in which the shoot moves so that the shoot cannot be shaken out of the desired position or pushed back except by releasing the knob. To release the shoot the knob is raised when the shoot is pushed forward by the spiral spring, the knob moving with it along a slot in the top of the bolt, etc., depressed by the aforementioned spring, which drops into the slot at right angles to the shoot, this making the fastening secure. To replace the shoot in its normal position the knob has to be raised and drawn back, when it will fall into the slot at the other end, and thus keep the bolt unfastened.

20,837 of 1903.—C. A. FLODQUIST: *Windows and Doors.*
An arrangement in windows of two or more divisions with double sashes, of outwardly opening double sashes swinging round a hinge or pivot, which may support one or more supplementary pivots fitted in such manner that when the sash is opened it swings towards an adjacent sash opening, the sash of which when opened either swings outwardly away from the sash first mentioned or swings inwardly.

7,596 of 1903.—E. H. GUNTHER: *Folding Furniture.*
This invention relates to folding furniture, such

* All these applications are in the stage to which opposition to the grant of Patents upon them can be made.

as chairs, tables, and the like. A chair made according to the invention comprises a pair of rectangular frames or trestles hinged together in the usual manner, the seat being pivoted to the longer of the two frames, against which it is folded when the chair is collapsed. To retain the chair in its open position, the longer frame is provided with a transverse bearing or supporting strip, which extends beyond the said frame, so that when the two hinged frames are opened out the smaller frame comes into contact with, and is held by, the projecting ends of the said bearing strip, so as to hold the two hinged frames in the required position. As an additional support, there is also provided upon the under side of the seat a second supporting strip, which is sufficiently long to extend into the path of the smaller of the hinged frames, which, when the seat is lowered, comes into contact with the said strip and is supported thereby. At this part the hinged frame is advantageously furnished with a bar, so that the aforesaid bearing strip is supported upon its whole length. In practice the said bar is attached to the under side of the seat by means of a strap or the like, so that when the seat is raised the said bar also raises the smaller of the hinged frames.

24,690 of 1902.—W. L. STANWAY: *Bricks.*

This invention relates to face bricks, and consists in so making them that they require no pointing, and do not show dampness between the joints. The bricks are made with a sinking on the top and right-hand side, which, when the bricks are laid together, acts as a mortar stop, and prevents the mortar from showing or oozing through to the face side of the wall, and makes a complete close butt joint.

27,154 of 1902.—G. S. ELLIS (Société Raffit et Bosc): *Fire-resisting Arch or Span Floors.*

An arch or span floor comprising for each case bay, arch, or span, two laterally skew backs of hollow pottery, terra-cotta, or other material, disposed so as to bear against the vertical webs of "I" girders forming the beams or joists, for the entire height of the girders or nearly so, each skew back having oblique bearing faces at its upper and lower portion respectively, upon which faces bear two courses composed of thin hollow blocks of pottery or other material having oblique joints, the lower course, which is plane, receiving or supporting the plaster or other facing forming the surface of the ceiling, and the upper course, which is in the form of an arch, serving in conjunction with the "I" girders, to support the flooring or fasten above, the combination constituting a hollow and light arch or span floor.

28,856 of 1902.—E. BAGNALL: *Manufacture of Wood Paving Blocks.*

The manufacture of wood paving blocks, whereby a number of short lengths of wood are held together by an iron or steel wire clip or stay rod.

17,660 of 1903.—J. W. MACKENZIE (The Cemental Fireproofing Co.): *Fireproof Floor and Ceiling Construction.*

This consists in the combination with floor beams of main supporting metal bars extending from beam to beam, and attached thereto by means of stirrups resting on the top flanges of the beams, and a concrete of similar plastic material centre, reinforced with metal rods and a wire lath or fabric, and suspended from said bars so as to permit the concrete or similar plastic materials forming the body of the floor to completely surround and inbed the bars, when said material is placed on the centre from above.

18,951 of 1903.—A. PIAT: *Cesspools, Surface Drains, and the like, and Apparatus for Evacuating the same.*

A removable cesspool, surface drain, or reservoir, consisting of any kind of perforated metal, surmounted by a basin, having a clack valve mounted on knife edges, and provided with a rod, which allows of its easy removal.

MEETINGS.

FRIDAY, DECEMBER 4.

Architectural Association.—Paper on "Photography for Architects," illustrated by lantern views, by the A.A. Camera and Cycling Club. 7.30 p.m.

Glasgow Architectural Craftsmen's Society.—8 p.m.

Junior Institution of Engineers (Westminster Palace Hotel).—Professor D. S. Capper, M.Inst.C.E., on "Recent Developments in the Construction and Working of Gas Engines." 8 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. W. H. A. Robertson on "Artificial Draught, as Applied by Fans to Steam Boilers." 8 p.m.

Incorporated Association of Municipal and County Engineers.—Metropolitan District Meeting to be held in the Municipal and County Club, 4, Whitehall-court, S.W. Discussion will then be resumed upon "The New By-Laws made by the London County Council in regard to Depositing Drainage Plans with the Sanitary Authority." 7.30 p.m.

SATURDAY, DECEMBER 5.

Sanitary Institute (Provincial Sessional Meeting, Town Hall, Leicester).—Discussion on "The Collection, Disposal, and Utilisation of Town Refuse in Leicester." The discussion will be opened by Mr. Frank W. Allen, A.M.Inst.C.E., to be followed by Messrs. E. George Mawbey, M.Inst.C.E., C. Killick Millard, M.D., D.Sc., Alderman T. Windley, J.P., Councillor A. Shaw, Leicester. The chair will be taken at 11.0 a.m. by Mr. William Whitaker, B.A., F.R.S., Chairman of Council of the Institute.

British Institute of Certified Carpenters.—Annual General Meeting. 6 p.m.

MONDAY, DECEMBER 7.

Surveyors' Institution.—Ordinary General Meeting. Mr. Edward Thomas Scammell, F.R.G.S., on "The Preservation of Timber, with special reference to its protection from Dry Rot and the increase of its usefulness for Estate Fencing and other purposes." 4 p.m.

Society of Arts (Cantor Lectures).—Mr. Bennett H. Brough on "The Mining of Non-Metallic Minerals." III. 8 p.m.

Liverpool Architectural Society (Incorporated).—Paper by Miss Ethel Charles, A.R.I.B.A., entitled "Reflections on Architecture." 6.15 p.m.

TUESDAY, DECEMBER 8.

Institute of Sanitary Engineers, Ltd. (Lectures in Practical Sanitary Science).—Dr. J. C. Thresh on "Water and Water Supply." II. 7 p.m.

Institution of Civil Engineers.—Paper to be further discussed: "On the Distribution of Mean and Extreme Annual Rainfall over the British Isles," by Mr. H. R. Mill, D.Sc., LL.D. 8 p.m.

WEDNESDAY, DECEMBER 9.

Sanitary Institute.—Discussion on "The Flooding of Basements in London by Sewage," to be opened by Mr. Maurice Fitzmaurice, G.M.G., M.A., M.Inst.C.E., and Dr. H. R. Kenwood. The chair will be taken by Sir Benjamin Baker, K.C.M.G. 8 p.m.

Society of Arts.—Mr. H. H. Cunynghame, C.B., on "Furnaces suitable for Jewellers' Work, Enamelling, Art Casting, and other suitable industries." 8 p.m.

Northern Architectural Association.—Mr. G. S. Aitken, F.S.A. Scot., on "Bothwell Castle," with lantern illustrations. 7.30 p.m.

Edinburgh Architectural Association.—Mr. J. Stuart Syme on "The Art of Sculpture in Ancient Egypt." 8 p.m.

Institution of Electrical Engineers.—Annual Dinner.

Institution of Civil Engineers.—Students' visit to the locomotive works of the North London Railway, at Bow Road. Assemble at the works. Train from Westminster Bridge Station to Bow Road, 1.40 p.m.

THURSDAY, DECEMBER 10.

London Institution.—Mr. E. Walter Maunder on "Mars and its 'Canals.'" Illustrated. 6 p.m.

Institution of Electrical Engineers (in the Rooms of the Institution of Civil Engineers).—December 10 being the 300th anniversary of the death of William Gilbert, the Mayor and other representatives of the Borough of Colchester will attend officially at 8 p.m. to receive an historical picture (representing Dr. Gilbert in the act of showing his electrical experiments to Queen Elizabeth and her Court) which will then be presented by the Institution of Electrical Engineers to the Borough of Colchester, in which town Gilbert was born in 1544 and died in 1603. A paper will then be read, entitled: "The Slow Registration of Rapid Phenomena by Strobographic Methods: the 'Ondographe' and 'Puissancegraphe' (Wave Recorder and Power Recorder)," by M. E. Hospitalier (President of the Société Internationale des Electriciens, Foreign Member of the Institution of Electrical Engineers). M. Hospitalier will also give a demonstration of the Ondograph.

Manchester Society of Architects.—Mr. Ellis Marsland on "The Statutory Registration of Architects." 6.45 p.m.

FRIDAY, DECEMBER 11.

Tramways and Light Railways Association (Society of Arts, John Street, Adelphi).—Mr. Atherley-Jones, K.C., M.P. (President), on "Protection in Special Relation to Tramway and Light Railway Enterprise." 8 p.m.

SATURDAY, DECEMBER 12.

The British Association of Waterworks Engineers.—Eighth Winter Meeting to be held at the Geological Society's Rooms, Burlington House, W. (1) Ballots will be taken for the Council and Officers for 1904-5, and for new Members and Associates. (2) Prof. Henry Robinson on "The Storage of Flood Water." (3) Mr. Alfred J. Jenkins on "The New Reservoir for the Hoylake and West Kirby Waterworks." (4) Mr. Neil J. Peters on "The Cogan Extensions of the Cardiff Corporation Waterworks." 11 a.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

November 18.—By FOX & VERGETTE (at Sandy).

Willington, &c., Beds.—Portions of the Willington and Copie Estate, 276 a. 1 r. 35 p., f., (in numerous lots)	£14,562

November 19.—By BAXTER, PAYNE, & LEPPER (at Bromley).

Bromley, Kent.—Homesdale-rd., &c., 27 plots of building land, f. (in lots)	665
70, Park-rd., f., w.r. 30*l.*	350

November 20.—By DILLEY, SON, & READ (at Warboys).

Warboys, Hunts.—Three copyhold fields, 25 a. 0 r. 23 p.	865
A copyhold house, y.r. 20*l.*	450
Nine cottages, f. and c., w.r. 29*l.* 15s.	258

November 21.—By VENTOM, BULL, & COOPER (at Lyme Regis).

Lyme Regis, Dorset.—Marine-parade, 2 freehold building plots	30
Bradford House, f., p.	£230

November 23.—By FORTESCUE & BRANSON.

Shepherd's Bush.—77, 79, and 81, Daviesville-rd. (flats), u.t. 91 yrs., g.r. 18*l.*, w.r. 137*l.* 4s.	1,070

By KEMSLEYS'.

Stapleford Abbotts, Essex.—Tyses Hill, a freehold cottage and four enclosures, 7 a. 1 r. 12 p., y.r. 16*l.*	405

November 24.—By G. GOULDSMITH, SON, & Co.

Belgravia.—81, Eaton-pl., and 81, Lyall-mews West, u.t. 25 yrs., g.r. 5*l.*, p.	3,500

By WALTER HALL.

Finchley.—2, Holden-rd. u.t. 76½ yrs., g.r. 10*l.* 10s., y.r. 60*l.*	470
Willesden.—Florence-ter., Chapter Works, u.t. 95 yrs., g.r. 12*l.*, y.r. 80*l.*	690

By MAY & ROWDEN.

Oxford-st.—71, Berwick-st., (S.), f., y.r. 60*l.*	1,600
Soho.—17, Bateman-st., f., y.r. 65*l.*	1,350

By SWORDER & SONS (at Bishop's Stortford).

Bishop's Stortford, Herts.—Windhill, Windhill House and 5 a., f., p.	3,100
Windhill-rd., St. Katharine's and 0 a. 3r. 12 p., f. and c., y.r. 80*l.*	1,850
Hadham-rd., Stort Lodge and 6 a. 2 r. 32 p., f. and c., y.r. 105*l.*	2,800
Marsh Barns Farm, 81 a. 0 r. 34 p., f., y.r. 160*l.* (in lots)	10,465
Old Hadham-rd., Victoria Villa and 1 a. 0 r. 38 p., f., y.r. 30*l.*	830
Hockerill-st., two cottages, f., y.r. 23*l.* 8s.	320
A perpetual rent charge of 4*l.* 19s. 8d. per annum	150

November 25.—By S. H. DAVIDS & Co.

Notting Hill.—261, Ladbroke-gr., u.t. 67 yrs., g.r. 10*l.*, y.r. 48*l.*	460
Shepherd's Bush.—114, Godolphin-rd., f., y.r. 46*l.* 16s.	675
Twickenham.—13, Victoria-rd., u.t. 63½ yrs., g.r. 6*l.* 10s., y.r. 25*l.*	225
Barnsbury.—17, Ellington-st., f., y.r. 87*l.*	880
Marylebone.—3, 4, and 5, Great Quebec-st. (S.), u.t. 9½ yrs., g.r. 135*l.*, w.r. 373*l.*	410

RUSHWORTH & STEVENS.

Regent's Park.—3, 4, 5, 6, and 7, Mornington-pl., u.t. 25 yrs., g.r. 35*l.*, y.r. 260*l.*	1,980
Woolwich Common, Kent.—Ordnance-rd., f.g.r. 8*l.* 1s., reversions in 25 and 54 yrs.	230
Ordnance-rd., f.g.r.'s 33*l.* 15s., reversion in 20 yrs.	1 050
Ordnance-rd., f.g.r.'s 22*l.*, reversion in 54 yrs.	535
Ordnance-rd., f.g.r. 20*l.* 5s., reversion in 22 yrs.	605
Ordnance-rd., f.g.r.'s 10*l.*, reversion in 25 yrs.	475
8 and 56, Ordnance-rd., f., y.r. 32*l.*	470
28 to 39 and 51, Ordnance-rd., f., w.r. 236*l.* 12s.	2,230

By W. A. RYDER & Co.

Leyton.—2, Alexander-rd., u.t. 77 yrs., g.r. 4*l.* 10s., y.r. 26*l.*	255

By R. TILEY & SON.

De Beauvoir Town.—142, Culford-rd., u.t. 19½ yrs., g.r. 3*l.* 10s., y.r. 32*l.*	245

By THOMAS WRIGHT.

Bockenham.—33, Mackenzie-rd., f., p.	590

By BOYTON, SONS, & BUCKMASTER (at Fulham).

Fulham.—10, Parson's-green, area 15,000 ft., f., p.	800
1, Eddiscombe-rd, u.t. 86½ yrs., g.r. 5*l.* 10s., e.r. 34*l.*	315
45 and 47, Britannia-rd., u.t. 53 yrs., g.r. 8*l.*, y.r. 60*l.*	640

By WATERER & SONS (at Hersham).

Hersham, Surrey.—Broad-la., Poplars Farm, 3 a. 1 r. 0 p., f., p.	1,025
Mud Town, freehold building land, 5 a. 1 r. 13 p., f.	300

By BELLAMY & Co. (at Putney).

Twickenham.—12 Crown-rd., e., f. y.r. 50*l.*	825

November 26.—By BALCH & BALCH.

Kentish Town.—53 to 59 (odd), Peckwater-st., u.t. 45½ yrs., g.r. 20*l.*, w.r. 135*l.* 4s.	985
Hornsey Rise.—80, Shaftesbury-rd., u.t. 70 yrs., g.r. 6*l.* 5s., p.	385
Holloway.—20, 22, and 24, Chalfont-rd., u.t. 30½ yrs., g.r. 15*l.*, y.r. 78*l.*	360

By BISLEY & SONS.

Walworth.—26 and 28, Heygate-st., u.t. 30 yrs., g.r. 10*l.*, w.r. 98*l.* 10s.	550
Bermondsey.—11, Ambrose-st., u.t. 24½ yrs., g.r. 2*l.*, w.r. 33*l.* 16s.	245
Rotherhithe.—271 and 273, Lower-rd., u.t. 15½ yrs., g.r. 6*l.*, y.r. 52*l.*	295
Silver-st., a plot of freehold building land	145

By FAREBROTHER, ELLIS, & Co.

City of London.—75, 75a, and 76, Little Britain (S.), area 3,250 ft., f., y.r. 380*l.*	11,000
Battersea.—9 to 15 (odd), Este-rd., u.t. 40 yrs., g.r. 10*l.*, w.r. 98*l.* 16s.	600

By HAMMERSLEY, KENNEDY, & Co.

Portman-sq.—32 and 33, York-pl. (boarding houses), beneficial leases for 9½ yrs., y.r. 212*l.* 10s. (including goodwill, furniture, &c.)	810

By WM. HOLLIS.

Hendon.—Brent-st., New Lodge and 2½ a., f., e.r. 16*l.*	3,500

By JOHNSON & BYFIELD.

Canonbury.—62, Marquess-rd., u.t. 42 yrs., g.r. 8*l.*, y.r. 50*l.*	410
Holloway.—79, Tabley-rd., u.t. 62½ yrs., g.r. 7*l.* 7s., y.r. 42*l.*	405

By W. MARTIN & Co.

Peckham.—15 and 16, The Gdns., u.t. 72½ yrs., g.r. 14*l.*, y.r. 68*l.*	610
Dulwich.—71 and 73, Glengarry-rd., u.t. 76½ yrs., g.r. 12*l.* 12s., y.r. 60*l.* 12s.	495
57, 59 and 61, Rodwell-rd., u.t. 74 yrs., g.r. 18*l.*, w.r. 107*l.* 18s.	780

By NOTT, CARTWRIGHT, & ETCHES.

Wimbledon.—Palmerston-rd., &c., f.g.r. 7*l.*, reversion in 73 yrs.	190

By WALTER SIMMONDS.

Bermondsey.—7 and 9, Dockley-rd., u.t. 33½ yrs., g.r. 10*l.*, w.r. 88*l.* 8s.	405
11 and 13, Dockley-rd., u.t. 33½ yrs., g.r. 10*l.*, w.r. 88*l.* 8s.	440

15 and 17, Dockley-rd., u.t. 33½ yrs., g.r. 10*l.*, w.r. 88*l.* 8*s.* £465
New Malden, Surrey.—11 and 13, Grafton-rd., u.t. 59 yrs., g.r. 6*l.*, w.r. 40*l.* 0*s.* 220

By Stimson & Sons.

Blackfriars.—46, Stamford-st., f., y.r. 65*l.* 90
53 and 55, Stamford st. (S), u.t. 19 yrs., g.r. 20*l.*, y.r. 120*l.* 700
Southwark.—125 and 126, Great Suffolk-st. (S), f., y.r. 84*l.* 1,310
Walworth.—205, Walworth-rd. (S), f., y.r. 55*l.* 940
Clapham.—86, Abbeville-rd., u.t. 76¼ yrs., g.r. 9*l.*, e.r. 50*l.* 510
Peckham.—2, 4, 6, and 8, Choumert-rd. (S), u.t. 62 yrs., g.r. 10*l.* 10*s.* d., y.r. 168*l.* 1,900
6, Lyndhurst-sq., f., e.r. 65*l.* 1,000
Lambeth.—1 to 26, Howley-pl., u.t. 19 yrs., gr. 110*l.*, w.r. 681*l.* 4*s.* 3,010
Kensington.—1, Eli-mews., u.t. 77 yrs., g.r. 5*l.*, y.r. 60*l.* 595
St. Pancras.—64, Barclay-st., u.t. 10½ yrs., g.r. 3*l.* 10*s.*, e.r. 52*l.* 150
Clapham.—2, Albert-sq.-mews, u.t. 41¾ yrs., g.r. nil, w.r. 27*l.* 16*s.* 165

By H. Holmes & Co. (on Premises).

Pentonville.—23, Claremont-sq., u.t. 8½ yrs., g.r. 3*l.*, e.r 60*l.* 325

November 27.—By Rawley Cross & Co.

Wimbledon.—Victoria-cres., freehold building site, area 5,000 ft., p. 1,470
Notting Hill.—32, Ladbroke-gr., u.t. 19 yrs., g.r. 10*l.*, y.r. 60*l.* 310

By Robins, Gore, & Mercer.

Soho.—11, Old Compton-st. (S), f., y.r. 70*l.* 1,950

By Tyser, Greenwood, & Cryer.

St. John's Wood.—10, Nugent-ter. (S), u.t. 63 yrs., g.r. 15*l.*, w.r. 94*l.* 10*s.* 510
Chiswick.—32 and 34, Essex-pl., f., w.r. 31*l.* 4*s.* 250
Barnes.—Station-rd., Prairie Cottage, f., e.r. 50*l.* 675

By Hollingsworth & Collyer.

Northfleet, Kent.—37, Cooper's-rd., f., w.r. 36*l.* 8*s.* 260

***Contractions used in these lists.*—F.g.r.** for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 16 6	per 1,000 alongside, in river
Rough Stocks and Grizzles	1 13 0	" " "
Facing Stocks	2 12 0	" " "
Shippers	2 5 0	" " "
Flettons	1 10 0	" at railway depôt
Red wire Cuts	1 13 0	" " "
Best Fareham Red	3 12 0	" " "
Best Red Pressed Ruabon Facing	5 0 0	" " "
Best Blue Pressed Staffordshire	4 4 0	" " "
Do. Bullnose	4 10 0	" " "
Best Stourbridge Fire Bricks	4 8 0	" " "
GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers	13 0 0	" " "
Headers	12 0 0	" " "
Quoins, Bullnose, and Flats	17 0 0	" " "
Double Stretchers	19 0 0	" " "
Double Headers	16 0 0	" " "
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamfered, Squints	20 0 0	" " "
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	" " "
Quoins, Bullnose, and Flats	14 0 0	" " "
Double Stretchers	15 0 0	" " "
Double Headers	14 0 0	" " "
One Side and two Ends	15 0 0	" " "
Two Sides and one End	15 0 0	" " "
Splays, Chamfered, Squints	14 0 0	" " "
Second Quality White and Dipped Salt Glazed	2 0 0	" less than best.

	s. d.	
Thames and Pit Sand	6 9	per yard, delivered.
Thames Ballast	6 0	" "
Best Portland Cement	30 0	per ton, delivered.
Best Ground Blue Lias Lime	21 0	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	11*s.* 6*d.*	per yard, delivered.
Stourbridge Fire Clay in sacks	27*s.* 6*d.*	per ton at rly. dpt.

PRICES CURRENT (*continued*).

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington depôt	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½	" "
PORTLAND STONE (20 ft. average)—		
Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2 1	" "
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2 2½	" "

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt
Beer in blocks	1 6	" "
Greenshill "	1 10	" "
Darley Dale in blocks	2 4	" "
Red Corsehill "	2 5	" "
Closeburn Red Freestone	2 0	" "
Red Mansfield "	2 4	" "

YORK STONE—*Robin Hood Quality.*

	s. d.	
Scappled random blocks	2 10	per ft. cube, deld. rly. depôt
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per foot super. "
6 in. Rubbed two sides Ditto, Ditto	2 6	" "
3 in. Sawn two sides slabs (random sizes)	0 11½	"
2 in. to 2½ in. Sawn one side slabs (random sizes)	0 7½	" "
1½ in. to 2 in. ditto, ditto	0 6	" "
Scappled random blocks	3 0	per ft. cube "
6 in. sawn two sides, landings to sizes (under 40 ft. sup.)	2 8	per ft. super. "
6 in Rubbed two sides Ditto	—	" "
3 in. sawn two sides slabs (random sizes)	1 2	" "
2 in. self-faced random flags	0 5	" "
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube.
" " " 6 in. sawn both sides landings	2 7	deld. rly. depôt. per ft. super. deld. rly. depôt.
" " " 3 in. do.	1 2½	" "

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor	13 2 6	per 1000 of 1200 at rly. dep.
20×12 " "	13 17 6	" "
20×10 best seconds "	12 15 0	" "
20×12 " " "	13 10 0	" "
16×8 best "	7 0 0	"
20×10 best blue Portmadoc	12 12 6	" "
16×8 best blue Portmadoc	6 12 6	" "
20×10 best Eureka unfading green	15 2 6	" "
20×12 best Eureka unfading green	17 2 6	" "
18×10 " "	12 10 0	" "
16×8 " "	10 5 0	" "
20×10 permanent green	11 10 0	" "
18×10 " "	9 10 0	" "
16×8 "	6 10 0	" "

TILES.

	s. d.	
Best plain red roofing tiles	42 0	per 1,000 at rly. depot.
Hip and valley tiles	3 7	per doz. " "
Best Broseley tiles	50 0	per 1,000 " "
Do. Ornamental Tiles	52 6	" " "
Hip and Valley tiles	4 0	per doz. " "
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 " "
Do. Ornamental Do.	60 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 0	" " "
Best Red or Mottled Staffordshire Do. (Peakes)	51 9	per 1,000 " "
Do. Ornamental Do.	54 6	" " "
Hip tiles	4 1	per doz. " "
Valley tiles	3 8	" " "
Best "Rosemary" brand plain tiles	48 0	per 1,000 " "
Do. Ornamental Do	50 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 8	" " "

WOOD.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	15 10 0	16 10 0
Deals: best 3 by 9	14 10 0	15 10 0
Battens: best 2½ in by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0	12 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	" " "
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	9 10 0
Foreign Sawn Boards— 1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.
¾ in.	1 0 0	"
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Small timber (6 in. to 8 in.)	3 0 0	3 10 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft. average)	3 5 0	3 15 0

PRICES CURRENT (*continued*).

WOOD.

	At per standard. £ s. d.	£ s. d.
JOINERS' WOOD.		
White Sea: First yellow deals, 3 in. by 11 in.	23 0 0	24 0 0
3 in. by 9 in.	21 0 0	22 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0
Second yellow deals, 3 in. by 11 in.	18 10 0	20 0 0
" " 3 in. by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in.	18 0 0	19 10 0
Battens	13 10 0	15 0 0
Petersburg: second yellow deals, 3 in. by 11 in.	16 0 0	17 0 0
Do. 3 in. by 9 in.	14 10 0	16 0 0
Battens	11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	14 10 0	15 10 0
" " 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0
" " 3 in. by 9 in.	12 10 0	13 10 0
" " battens	9 10 0	10 10 0
Pitch-pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	33 0 0	upwards.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs—Large, per ft. cube	0 2 6	0 3 6
Small " "	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7	0 0 8
¾ in. do.	0 0 6½	—
Dry Mahogany—Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	21 0 0
American Whitewood Planks—per ft. cube	0 4 0	—
Prepared Flooring—	Per square.	
1 in. cy 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 1 6
1 in. by 7 in. white, planed and shot	0 11 6	0 13 6
1 in. by 7 in. white, planed and matched	0 12 0	0 14 0
1¼ in. by 7 in. white, planed and matched	0 14 6	0 16 6
⅞ in. by 7 in. yellow, matched and beaded or V-jointed boards	0 11 0	0 13 6
¾ in. by 7 in. do. do. do.	0 14 0	0 18 0
1 in. by 7 in. white do. do.	0 10 0	0 11 6
1 in. by 7 in. do. do. do.	0 11 6	0 13 6

6-in. at 6d. to 9d. per square less than 7-in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0	7 5 0
Compound Girders, " "	8 2 6	9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 2 6	8 5 6

METALS.

	Per ton, in London £ s. d.	£ s. d.
IRON—		
Common Bars	7 10 0	8 0 0
Staffordshire Crown Bars, good merchant quality	8 0 0	8 10 0
Staffordshire "Marked Bars"	10 10 0	—
Mild Steel Bars	8 15 0	9 5 0
Hoop Iron, basis price	9 5 0	9 10 0
" " galvanised	17 10 0	—

(*And upwards, according to size and gauge.)

Sheet Iron (Black)— Ordinary sizes to 20 g.	9 15 0	—
" " 24 g.	10 15 0	—
" " 26 g.	12 5 0	—
Sheet Iron, Galvanised, flat, ordinary quality— Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g	12 15 0	—
Ordinary sizes to 22 g. and 24 g.	13 5 0	—
" " 26 g.	14 5 0	—
Sheet Iron, Galvanised, flat, best quality— Ordinary sizes to 20 g.	16 0 0	—
" " 22 g. and 24 g.	16 10 0	—
" " 26 g.	18 0 0	—
Galvanised Corrugated Sheets— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 15 0	—
" " 22 g. and 24 g.	13 5 0	—
" " 26 g.	14 0 0	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11 15 0	—
Best Soft Steel Sheets, 22 g. and 24 g.	12 15 0	—
" " " 26 g.	14 0 0	—
Cut nails, 3 in. to 6 in.	9 5 0	9 15 0

(Under 3 in., usual trade extras.)

[*See also page 593.*

COMPETITION, CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITION.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
*Free Library Buildings	Wakefield Council	Not stated	Jan. 20 '04

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be delivered
Sewering, &c. Wilberforce-terrace, Hulme	Paving Commit. Manchester Corp.	Surveyor's Office, Town Hall, Manchester	Dec. 7
Flagging, &c., North-road, from Melling-st. to Cross-st.	do.	do.	do.
Draining, Paving, &c. Passages, Rusholme	do.	do.	do.
Sewer Works, Manor Park, Lee	Lewisham Borough Council	E. Wright, Clerk, Catford, S.E.	do.
Kerbing, &c., Streets, (Neuchatel-road, &c.)	do.	do.	do.
Kerbing, &c. Hither Green-lane	do.	do.	do.
Kerbing, &c. Bromley-road	do.	do.	do.
Cast-iron Pipes with Trough Ends for Cables	Glasgow Corp. Electricity Depart.	W. A. Chamen, Engineer, 75, Waterloo-street, Glasgow	do.
Cast-iron Fuse-Boxes	do.	do.	do.
Kerbing, &c., Hoddesdon	Hertfordshire County Council	Urban A. Smith, County Surveyor, Hatfield	do.
Fire Hose	Borough of Guildford	A. W. Hall, Artillery-road, Guildford	do.
Self-recording Tide Gauge	Southampton Harbour Board	J. E. Pailthorpe, Clerk to the Board	do.
Painting, &c., six Firemen's Dwellings	Leeds Corporation	City Engineer, Municipal Buildings, Leeds	do.
House and Chapel, Whiteash, Letterfourie Estate	.....	A. Tod Brown, Civil Engineer, 12, Low-street, Buckie	do.
Branch Bank and House, Bingley	Craven Bank, Ltd.	R. Armistead, Architect, 8, Charles-street, Bradford	do.
Wrought-iron Tubes and Fittings	Wilmslow &c. Gas Co.	W. Severs, Engineer and Manager, Gasworks, Wilmslow	Dec. 8
Cottages at Provost Gasworks	Glasgow Corporation	A. Wilson, Engineer, 45, John-street, Glasgow	do.
Private Improvement Works, University-road	Bootle Corporation	Borough Engineer, Bootle	do.
Additions to Union Infirmary	Keighley Guardians	Moore & Crabtree, Architects, York Chambers, Keighley	do.
Alterations and Additions to Town Hall	Herne Bay U.D.C.	F. W. J. Palmer, Surveyor, Council Offices, Town Hall, Herne Bay	do.
Iron and Glass Verandah to Town Hall	do.	do.	do.
Three Houses and House and Shop, Corban-street, &c.	.....	J. W. C. Atkinson, Architect, 1, Ivegate, Bradford	do.
Six Houses, The Walk, Birdwell	.....	P. A. Hinchliffe, Architect, 14, Regent-street, Barnsley	Dec. 9
Tarpaving Playgnds, &c., Air Balloon Hill Sch., George	Bristol Education Committee	La Trobe & Weston, Architects, 23, Clare-street, Bristol	do.
Tarpaving Playgrounds, Moorfields School, St. George	do.	do.	do.
Tarpaving Playgrounds, Wick-rd. School, Bridlington	do.	Holbrow & Oaten, Architects, 9, Clare-street, Bristol	do.
Drain Pipes, Bricks, Cement, &c.	Macclesfield Corporation	E. E. Adshaw, Borough Engineer, Macclesfield	do.
Roadmaking, Rathfarnham	South Dublin District Council	T. J. Byrne, A.R.I.B.A., 1, James-street, Dublin	do.
Additions to Cart-shed, Ramsden-street	Barrow-in-Furness Corporation	Borough Engineer, Barrow-in-Furness	do.
Five Houses and Shop, Ravensthorpe	.....	J. Barton & Son, Architects, Halifax-road, Dewsbury	do.
House and Farm Buildings, Belton, Doncaster	G. A. Maw	H. Kelsey, Architect, Queen-street, Epworth	Dec. 10
Stores	Leicester Corporation	E. G. Mowbey, M.Inst.C.E., Borough Engineer, Leicester	do.
Granite Kerb, Setts, &c.	do.	do.	do.
1,000 yds. 9-in. Pipe Sewer	Tynemouth R.D.C.	A. S. Dinning, 21, Ellison-place, Newcastle-on-Tyne	do.
Plumbers' and Glaziers' Work for General Repairs	Sheffield Corporation	J. F. Moss, Leopold-street, Sheffield	do.
Villa Residence, Bromley-road, Bingley	W. R. Dawson	W. Rhodes Nunns, Architect, Bingley	do.
1¼ miles Distributing Cable	Gas and Electricity Dep., Stockport	A. J. H. Carter, Electricity Works, Milligate, Stockport	do.
Lavatory, Hamilton Drive, Botanic Gardens	Glasgow Corporation	Office of Public Works, 64, Cochrane-street, Glasgow	do.
Cast-Iron Plates, Stuart-street Generating Station	Electricity Committee, Manchester	F. E. Hughes, Electricity Department, Town Hall, Manchester	Dec. 11
*Coast Guard Station at Littlehampton	The Admiralty	Superintending Engineer, H.M. Dockyard, Portsmouth	do.
*New Coastguard Station at Queenborough	do.	Director of Works Department, 21, Northumberland-avenue, W.C.	do.
Offices for Abattoirs, Tack-street	Markets Committee, Manchester	City Architect, Town Hall, Manchester	do.
Water Main, Clayton-with-Trickley and Thurnscae	Doncaster R.D.C.	J. H. Taylor, M.Inst.C.E., Manor House, Barnsley	do.
Covered Service Reservoir, Knab's Hill, Thurnscae	do.	do.	do.
Sunday School, Highfield-avenue, Wortley	United Methodist Free Church	C. F. Wilkinson, Architect, 35, Park-square, Leeds	do.
*Internal Cleaning and Painting at S.W. Hospital	Metropolitan Asylums Board	Office of the Board, Embankment, E.C.	do.
400 tons 15-in. Cast-Iron Pipes	Glasgow Corporation	J. R. Sutherland, Engineer to Water Department, 45, John-street	Dec. 12
Arcade and Concert Hall, Aberystwyth	D. Phillips	J. A. Jones, Architect, 7, Queen's-terrace, Aberystwyth	do.
Materials (ropes excepted)	Hetton Coal Co.	T. Robson, Hetton Colliery, Hetton-le-Hole, R.S.O.	do.
Breaking and Carting Stone for Road Repairs	Northumberland County Council	J. A. Bean, County Surveyor, Moot Hall, Newcastle-on-Tyne	do.
Earthenware Ducts for Drawing-in System of Mains	Electricity Committee, Warrington	W. H. Grimsdale, Borough Elec. Engineer, Howley, Warrington	Dec. 14
130 Gas Lamp Columns, &c.	Darfield U.D.C.	D. Hammerton, Surveyor to the Council, Darfield, near Barnsley	do.
Painting, &c., of Workhouse, Lewisham	Lewisham Guardians	H. C. Mott, Union Offices, 286, High-street, Lewisham, S.E.	do.
Sanitary Pails	Barrow-upon-Soar, U.D.C.	H. Herrod, Barrow-on-Soar	do.
Painting, &c., Roof Work, Amiens-street Station	G.N.R. Co., Ireland	W. H. Mills, Engineer-in-Chief, Amiens-street Terminus, Dublin	do.
Fireclay Goods for Gasworks	Manchester Gas Committee	C. Nickson, Gas Offices, Town Hall, Manchester	do.
Paving Ware-road	Hertford Corporation	Borough Surveyor, Hertford	Dec. 15
Railway Lines, Bristol Harbour	G.W.R.	Engineer, Paddington Station, London	do.
*Iron Fencing	Tottenham U.D.C.	Council's Engineer, 712, High-road, Tottenham	do.
*Making-up Roads	do.	do.	do.
*Making-up Cliffden-road	Brentford U.D.C.	Council's Surveyor, Boston-road, Brentford	do.
Pair of Semi-Detached Villas, Moor Lane, Halifax	.....	W. Clement Williams, Architect, 29, Southgate, Halifax	Dec. 16
Pair of Villa Residences, Moor-lane, Illingworth	.....	W. C. Williams, Architect, 29, Southgate, Halifax	do.
Brushes	Leicester Corporation	E. J. Mawbey, M.Inst.C.E., Borough Engineer, Leicester	Dec. 17
*Museum and Art Gallery	Kingston-on-Thames Corporation	A. Cox, Architect, 4, Adam-street, Adelphi, W.C.	do.
1¼ miles Cast-Iron Pipes & Erection Engine Room, &c.	Welton R.D.C.	Elliot & Brown, Engineers, Burton Bgs., Parliament-st., Nottingham	Dec. 18
Dining-Room, Dormitory, &c., Cnty Asylum, Lancaster	Visiting Committee	Clerk of Works at the Asylum	do.
*Alterations to County Court, Pontypridd	Commissioners of H.M. Works, &c.	Registrar County Court, Pontypridd	do.
*Annual Contracts	House Committee, Guy's Hospital	The Superintendent, Guy's Hospital, S.E.	do.
Lockup and Court House, Eckington, near Sheffield	Derbyshire County Council	J. Soames Story, County Surveyor, St. Mary's Gate, Derby	Dec. 19
*Erection of Superstructure of Parcel Office	H.M. Office of Works	H.M. Office of Works, Storye's Gate, S.W.	do.
64 Houses, Tylorstown	Duke of York Building Club	D. C. Evans, Duke of York Hotel, Tylorstown	Dec. 21
Removal of Bridge & Erect New One over Calder Water	Lanark District Con. (Middle Ward)	W. L. Douglass, Civil Engineer, District Engineer, Hamilton	do.
Two Villa Residences, Hillsborough, Co. Down	.....	H. Hobart, Architect, Dromore, Co. Down	do.
Hospital at Workhouse, Jericho, Bury	Guardians Bury Union	A. Hopkinson, Architect, 15, Agur-street, Bury	Dec. 22
*New School, Napier-road	Gillingham (Kent) Education Com.	Secretary, 8, Waterloo-road, New Brompton, Kent	do.
Steel Girder Footbridge	Linton R.D.C.	A. M. Cook, Surveyor, Linton	Dec. 23
Stabling, Sheds, Mortuary, &c., Stanley-street	Horsham U.D.C.	S. Mitchell, 14, Market-square, Horsham	do.
Six Workmen's Cottages, Bradwell-on-Sea	Maldon R.D.C.	H. G. Keywood, Surveyor, Maldon	Dec. 28
*Cottage Homes, New Malden	Kingston Union	W. H. Hope, Architect, Seymour-road, Hampton Wick	do.
*Superstructure of New Government Offices, Cardiff	Commissioners of H.M. Works, &c.	Registrar County Court, Cardiff	Dec. 29
Sewage Dis. Wks. on Bacterial Principle, W. Shield-row	Stanley U.D.C.	J. Routledge, Surveyor to Council, Front-street, Stanley	Dec. 30
*Stoneware Pipe Sewers, &c., &c.	Coalville U.D.C.	J. B. Everard, 6, Millstone-lane, Leicester	Jan. 4, '04
Drainage Works, Boldon	H. Blenkinsop, Ross, Belford	Mr. Farrow, Brockley Whins Farm, Boldon	No date.
*Police Station, Wokingham	Berks Standing Joint Committe	County Surveyor, Broadway Buildings, Reading	do.
Re-erection after Fire of Warehouses, Collingdon-road	Cardiff Grain Co., Ltd.	H. Budgen, Architect, 95, St. Mary-street, Cardiff	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Draughtsman	Southampton Borough Council	24. 10s. per week	Dec. 8
*Road Foreman	West Ham Council	200*l.*	Dec. 14
*Head of Building Trades Department	Northern Polytecnic Institute	250*l.*	do.
*Assistant in Building Trades Department	do.	100*l.*	do.
*Assistant Lecturer, &c. (Chemical Department)	do.	90*l.*	do.
*Architect's Assistant	London County Council	150*l.*	do.
*Surveyor's Assistant	do.	150*l.*	do.
*Assistant Examiners in Patent Office	Civil Service Commissioners	Not stated	Dec. 17
*General Assistant (City Engineer's Department)	Norwich Corporation	100*l.*	Dec. 21
*Assistant Examiners in Patent office	Civil Service Commissioners	Not stated	Dec. 22
*Assistant Civil Engineer, Admiralty	do.	Not stated	Jan. 7, '04.

Those marked with an asterisk (*) are advertised in this Number. **Competition, iv. Contracts, iv. vi. viii. & x. Public Appointments, xix. & xxi.**

PRICES CURRENT (*continued*).

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. and up	14 0 0 ...	—
Pipe in coils	14 10 0 ...	—
Soil pipe	17 0 0 ...	—
Compo Pipe	17 0 0 ...	—
ZINC—Sheet—		
Vieille Montagne ..... ton	26 0 0 ...	—
Silesian	25 15 0 ...	—
COPPER—		
Strong Sheet ..... per lb.	0 0 10½ ...	—
Thin ..... „	0 0 11½ ...	—
Copper nails ..... „	0 0 11 ...	—
BRASS—		
Strong Sheet ..... per lb.	0 0 10 ...	—
Thin „ ..... „	0 0 11 ...	—
TIN—English Ingots ..... „	0 1 4 ...	—
SOLDER—Plumbers' ..... „	0 0 6 ...	—
Tinmen's ..... „	0 0 8 ...	—
Blowpipe ..... „	0 0 9 ...	—

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered
„ fourths	1½d. „ „
21 oz. thirds	3½d. „ „
„ fourths	2½d. „ „
26 oz. thirds	3½d. „ „
„ fourths	3½d. „ „
32 oz. thirds	4½d. „ „
„ fourths	4½d. „ „
Fluted sheet, 15 oz.	2½d. „ „
„ 21 oz.	3½d. „ „
½ Hartley's Rolled Plate	1½d. „ „
⅜ „ „ „ „	2d. „ „
½ „ „ „ „	2½d. „ „

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes or barrels ...	per gallon	0 1 9
„ „ „ in drums	„	0 2 1
Boiled „ „ in pipes or barrels ...	„	0 2 0
„ „ „ in drums	„	0 2 4
Turpentine, in barrels	„	0 3 8
„ in drums	„	0 3 10
Genuine Ground English White Lead	per ton	19 0 0
Red Lead, Dry	„	19 0 0
Best Linseed Oil Putty	per cwt.	0 8 0
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

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J. H.—J. W. R. (Below our limit).

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TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*

BEXHILL (Sussex).—For the erection of a Coronation Clock Tower, West Parade, for the Corporation. Mr. Robert Hembrow, architect, 174, Queen's Road, Hastings. Quantities by Mr. J. T. Halliday, Bexhill-on-Sea:—

Clock excepted.

Gaston & Ramond, Bexhill-on-Sea* £232 16

Clock only.

T. Wright & Son, Devonshire-road, Bexhill* £82 0

BRIDLINGTON.—For Parade Extension Works, Royal Prince's Parade, for the Corporation. Mr. E. R. Matthews, C.E., Town Hall, Bridlington:—

G. Bell, Manchester £20,000

BRISTOL.—For taking down and re-erecting the side wall of 42, Mary-le-Port-street, for the Trustees. Mr. John A. Wright, surveyor, 6, Unity-street, College-green, Bristol. Quantities by Mr. A. Barratt:—

J. Perkins & Son	£470	E. Horton	£305
E. Walters & Son	410	H.W. & E. L. Neale ...	198
G. T. Daltry	394	E. Clark	295
W. A. Ship	355	Eastabrook	295
Jones & Hill	329	H. A. Forse & Sons, 143, Ashley-road* ...	295
W. J. Bennett	320		

BRISTOL.—For the erection of warehouses, &c., Albert-road, St. Phillip's, Bristol, for Messrs. C. Vaughan & Sons. Mr. John A. Wright, architect, Bristol. Quantities by Mr. A. Barratt, Bristol:—

T. Broad	£2,376	A. J. Beaven	£2,150
Messrs. Easterbrook	2,368	R. Wilkins	2,064
A. E. Longden	2,300	Walkerdene	1,895
Perkins & Sons	2,295	W. J. Bennett*	1,770

[All of Bristol.]

BRITON FERRY (Wales).—For the supply of road metal for the Urban District Council. Mr. A. H. Clarke, Borough Engineer, Council Offices, Briton Ferry:—

Pentoyllt Dinas	s. d.		s. d.
Silica Co.	6 0	W. P. Powell & Co.	5 2
J. Evan Griffith ...	5 5	Bennet Brothers ...	4 9

[All per ton.]

COWPEN (Northumberland.)—For making-up William-street, at Crofton, for Cowpen Urban District Council. Mr. Robert Grieves, Surveyor:—

G. Dixon	£611 12 3	J. Shannon ...	£520 16 1½
J. Maclaren ...	608 14 6	J. Robson, Newcastle-on-Tyne*	516 18 10
G. E. Simpson...	558 16 0		

DARENTH.—For installation of telephones at the Darenth Asylum, for the Met. Asylums Board:—

Coleby & Co. ...	£750 0 0	Weston & Sons	£344 0 0
Nat. Telephone Co., Ltd.	620 0 0	Wippell Bros. & Row	340 0 0
A. Smith	586 0 0	Western Electric Co.	319 4 0
Donnison, Sillem & Co.	450 0 0	New System Private Telephone Co., Ltd.	298 18 10
Jackson Bros...	440 0 0	W. Defries	289 0 0
Fuller, Macleod & Co., Ltd. ...	420 0 0	Private Wire & Telephone Installation Co., Ltd.	284 17 0
B. & R. Durant	413 13 5	Cox-Walkers, Darlington ...	263 0 0
Comyn, Ching & Co., Ltd. ...	374 0 0	Hodgson & Co.,	257 18 0
Saunders & Co.	369 0 0	Mackrill & Sons	247 13 7
British Home & Office Telephone Co.	364 0 0	P. Dewhirst, Blackpool* ...	245 10 0
Rider & Co.	349 0 0		
Wan Bros.	345 12 9		
Julius Sax & Co.	345 0 0		

[Engineer's estimate, £240.]

ECCLESALL (Sheffield).—For alterations and additions to the Rising Sun Inn, Abbey Lane, for Mr. F. Cockerham. Messrs. Hall & Fenton, architects, 14, St. James-row, Sheffield. Quantities by the architects:—

W. T. Sharp ...	£900 0 0	Badger & Appleby	£703 0 0
Wilkinson & Sons	880 5 0	H. Watkinson	690 0 0
E. Hart	862 17 0	H. White	688 0 0
G. H. Bown ...	847 4 4	W. Needham ...	687 0 0
Enos Moor	799 11 0	J. S. Teanby ...	674 0 0
G. Vaughan	750 0 0	M. Hancock ...	670 0 0
Martin & Hughes	740 0 0	J. Reed	665 0 0
G. Allen	715 0 0	T. Margerrison Church-street Dronfield* ...	673 0 0
J. Mason	710 0 0		
E. & W. Oxley	709 10 0		

FRIMLEY (Surrey.)—For the construction of two miles of 9 in. sewers, Chobham-road, for the Urban District Council. Mr. F. C. Wren, engineer, High-street, Camberley:—

C. Mott & Sons	£3,176 19 9	F. Roberts	£1,969 18 6
A. C. Soane	2,384 0 0	D. H. Porter ...	1,956 0 0
W. Norris	2,317 5 6	Wheeler, Southwark*	1,840 0 0
J. Coker	2,295 0 0	Swaker	1,435 19 0
Messrs. Streeter & Todhunter	2,283 15 9		

HAYLE (Cornwall).—For the erection of a dwelling-house, Hayle Towans. Mr. Humphrey T. Broad, architect:—

R. Waters & Ford	£1,760 0	William Rutter...	£600 0
White & Thomas	1,350 0	W. J. Jary	508 14
W. J. Roach	740 0	Edward Dunn ...	507 10

HERTFORD.—For erection of a pair of cottages, Rook's Nest Lane, Therfield, for Mr. C. Newling. Mr. Jas. W. Hall, architect and surveyor, 13, Priory-park-road, Brondesbury, N.W.:—

	Well.	Building.
T. Nevett	£30	£760
Gemsons	19	564
A. Balfour, Kilburn	17	432

LONDON.—For sewage works for Hendon Urban District Council. Mr. S. S. Grimley, Surveyor, The Burroughs, Hendon, N.W.:—

	12 in. Sewer, Mill Hill Rd.	Gullies Brent Street.	Bell Lane Footpath.	New Brent St. Tar Paving.
	£ s. d.	£ s.	£ s. d.	£ s.
T. Adams	424 19 6	70 10	176 5 0	99 5
H. Williams	344 7 6	92 10	152 10 10	97 0
*Ballard, Ld, Child's Hill	282 8 0	59 10	167 0 0	83 5
W. E. Constable & Co.	—	—	—	85 10
Goddard & Co.	—	—	—	81 15

LONDON.—For a pair of new tail shafts for use on the ss. *Bazalgette*, for the London County Council:—

Messrs. Wililam Beardmore & Co., Ltd.	£220 0
The North-Eastern Marine Engineering Co., Ltd.	182 0
The Darlington Forge Co., Ltd.	156 0
Messrs. John Spencer & Sons, Ltd.	148 5

LONDON. — For new factory, Northampton-row, Clerkenwell, E.C., for Messrs. W. A. Fincham & Co. Mr. H. Yolland Boreham, architect, 75, Finsbury-pavement, E.C.:—

Battley, Sons, & Holness	£3,066	Dove Bros.	£2,975
Chessum & Sons ...	2,995	Wagstaff & Sons ...	2,857
Grover & Son	2,982	Sabey & Son*	2,795

MARCH (Cambs.).—For the erection of a house in Norwood-side, for Mr. G. Theobald. Mr. W. Fovargue, architect, Causeway, March:—

Shanks	£282 0 0	Eggitt	£276 0 0
Heath	276 14 0	Whye & Turner	260 2 6
Whittlesey	276 0 0	Watson & Barrett March*	257 0 0

SWANAGE.—For the execution of road works, Ulwell-road. Mr. John Sidney, senior, Engineer, Town Hall, Swanage:—

H. & J. Hardy	£2,696 18 0	G. Pond	£2,150 0 0
W. M. Hardy	2,323 0 0	Frank Parsons	1,949 9 9
J. T. Whettham, jun.	2,275 0 0	Burt & Burt*, Swanage* ...	1,925 0 0
Parsons & Hayter	2,273 0 0		

SWINDON.—For the erection of five shops and Sunday-school premises in Faringdon-street, Swindon, for the Wesleyan Trustees. Mr. W. F. Bird, architect, Midsomer Norton, Bath. Quantities by the architect:—

Orchard & Sons	£8,398 0 0
Wills & Sons	7,995 0 0
George Kemp	7,749 0 0
H. & C. Spackman	7,725 0 0
R. J. Leighfield	7,583 11 1
A. J. Colborne	7,441 12 0
W. Warren	7,226 0 0
Tydeman Bros.	7,200 16 11
Joseph Williams, Swindon*	6,977 0 0

TONBRIDGE (Kent).—For Great Fishal Hall new stables. Mr. Delmé G. Mootham, architect, Effingham House, Arundel-street, Strand:—

C. Vinten	£353 5	M. Warren	£297 15
Punnett & Sons ...	307 0	Jarvis & Son	296 0
Martin & Co.	306 0		

WALTHAMSTOW.—For new billiard room, &c., The Limes, Walthamstow. Messrs. Geo. Baines & Son, architects, Clements-Inn, Strand, W.C.:—

S. J. Scott	£475 0
Battley, Sons, & Holness	370 0
Sands, Palmer, & Co.	350 0
T. Durden, 1, Oliver-road, Walthamstow*	274 10

LONDON SCHOOL BOARD TENDERS.

AT the last meeting of the London School Board the Works Committee submitted the following list of tenders:—

The interior cleaning at the following Schools will be executed between 19th December, 1903, and 9th January, 1904:—

BERESFORD-STREET:—

W. V. Goad	£335	J. F. Ford	£330
Bargman, Son & Co.	279	W. Hooper	320
W. Downs	250	W. Sayer & Son*	220
W. Read	240		

[*See also next page.*

BROOMSLEIGH-STREET:—

T. Cruwys	£249	Stevens Bros.	£243 0
H. Bouneau	303	Densham & Sons	223 10
Viney & Stone	276	W. Chappell*	195 0

CLIFTON-ROAD:—

Bulled & Co.	£271 0	H. Groves	£145 0 0
S. Musgrove	177 5	W. Banks*	144 19 6
W. J. Howie	172 0		

ECCLESBOURNE-ROAD:—

Patman & Fotheringham, Ltd.	£447 0 0	Grover & Son	£335 0
Dearing & Son	421 0 0	McCormick & Sons	316 0
Macey & Sons, Ltd.	383 14 6	C. & W. Hunnings	284 10
		Marchant & Hirst	257 0
		G. Barker*	242 0

EGLINTON-ROAD:—

Woollaston & Co.	£320 10	Proctor & Son	£220 0
W. Jolly	320 0	H. Groves	220 0
W. J. Howie	255 0	P. S. Howard	178 0
Sayer & Son	231 0	Hayter & Son*	174 8

ETHELBURGA-STREET:—

Johnson & Co., Ltd.	£328 0	R. A. Jewell	£208 0
Williams & Sons	260 0	Lathey Bros.	207 10
J. & M. Patrick	230 0	R. Triggs	207 0
R. S. Ronald	215 0	C. Gurling*	180 0

FIRCROFT-ROAD:—

Johnson & Co. Ltd.	£289 10	R. S. Ronald	£190
Williams & Sons	200 0	R. A. Jewell*	185

FLORA-GARDENS:—

C. F. Kearley	£257 0	G. H. Sealy	£197 0
W. Hammond	248 0	W. Hornett	193 0
Chinchen & Co.	219 0	W. Chappell	168 10
S. Polden	214 10	F. Chidley & Co.*	160 0
J. & M. Patrick	202 0		

FOSSDENE-ROAD:—

Woollaston & Co.	£298 0	Sayer & Son	£238 0
W. J. Howie	280 0	W. Jolly	230 0
Proctor & Son	255 0	H. Groves*	168 0
P. S. Howard	249 0		

FRIERN:—

H. Line	£310 0	W. Hooper	£207 0
Lathey Bros.	243 0	C. G. Jones	205 0
J. & C. Bowyer	229 0	H. Groves	192 0
Maxwell Bros., Ltd.	236 0	W. Read*	177 0

GLENISTER-ROAD:—

Woollaston & Co.	£216 10	H. Groves	£164 0 0
Proctor & Son	211 0	W. Banks	159 17 6
W. J. Howie	207 0	P. S. Howard*	134 10 0

HAWLEY-CRESCENT:—

T. Cruwys	£315	H. Wall & Co.	£181
Bate Bros.	256	M. Pearson	169
Thompson & Beveridge	213	Marchant & Hirst*	167
Viney & Stone	186		

"HIGHWAY" (B, G, I, and JM):—

Woollaston & Co.	£288 0	A. E. Symes	£271 0
H. Bouneau	280 0	J. F. Holliday	265 14
A. W. Derby	280 0	G. Barker*	255 0
Haydon & Sons	273 0		

KILBURN-LANE:—

General Builders, Ltd.	£284 0	Chinchen & Co.	£254 0
Densham & Sons	279 10	W. R. & A. Hide	234 15
C. F. Kearley	279 0	F. Chidley & Co.	231 0
W. Hammond	274 0	Bristow & Eatwell*	197 0

MARYON PARK:—

W. Jolly	£235 0	H. Groves	£165 0 0
Proctor & Son	197 0	W. Banks	153 17 6
P. S. Howard	179 0	W. J. Howie*	150 0 0

MAWBEY-ROAD:—

W. Downs	£322 0	W. J. Howie	£242 0
Maxwell Bros., Ltd.	280 0	Sayer & Son	214 0
H. J. Williams	246 0	E. Triggs*	191 0

REDVERS-STREET:—

Silk & Son	£219 10	H. Bouneau	£195 0
F. Bull	213 10	Haydon & Sons	173 0
A. W. Derby	204 0	Barrett & Power	167 0
Gavin Bros.	199 12	Runham Brown*	147 0

ROCHELLE-STREET:—

Barrett & Power	£119 0	H. Runham Brown	£106 0
W. Silk & Son	114 0	Belcher & Co., Ltd.	89 15
J. Haydon & Sons	107 0	F. Bull*	89 0

ST. JOHN'S (Halley-street):—

H. Bouneau	£177 6 6	Vigor & Co.*	£135 0 0
J. F. Holliday	161 9 0	G. Barker	125 0 0

WALDRON-ROAD:—

R. A. Jewell	£263 0	E. Flood	£215 0
E. P. Bulled & Co.	257 0	E. Triggs	197 10
R. S. Ronald	220 0	Hudson Bros.	197 0
Lathey Bros.	215 10	J. & M. Patrick*	197 0

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